NEWS IN BRIEF

Euro database market growth ing the 1,450 redundant Winsford

THE international market re-search firm Input has predicted that the European market for nn-line databases could approach that of the US by 1985 at an estimated \$4.3 hillion. Input believes that Videntext, viewdata, Eurnnet, PTT packet switched networks nd other information industry projects with government backing will boost the database market from its present \$150 million into a

GaAs saving

A TECHNIQUE that greatly reduces the cost of gallium arsenide has been developed by scientists at the Massachusetts Institute of Technology. Called Cleft, the approach uses a substrate of GaAs bouded to giass and thus reduces the amount of GaAs required. Government computing

PDP-11 add-in

DIGITAL Equipment users could be interested in what is said to be the first single board 256K-byte add-in memory for the PDP-11/44. Called the DR-144S it is manufactured is the JS by Dataram Corpor Chanbury, New Jersey, which says that it is completely compatible with DEC's MS11-M memory module for the 11/44. computer operations by civil servants seeking an improved pay award for all civil service unions looks increasingly likely, following an agreement by the nine unions to press for a joint increase. This will probably be 15%, instead of the 6% the government is threatening

Training aid sought

APPLICATIONS to the EBC for funding microtechnology training schemes have been made by the counties of Hereford and Worcester. Common market officials in Brussels are considering a request for £1,400,000 which would be prise selective strikes to retrain unattended by the s prise selective strikes involving the lewest possible people, giving the maximum impact. This points particularly to areas of revenue collecsed to remain unemployed under-

Computer security

AS part of security precautions after recent bomb blasts. Warwickshire police are to move communications and computer equipment into parts of police stations which are most difficult for intruders to reach.

Japanese market

equipment market in Japan is now half taken up by Japaneau producers. Five years ago the US had 75 per cent of the market in Japan. It still has 75 per cent of the total world market, which is growing at between 30 pers cent and 40 personal cours a year.

Buyer for ICL's Winsford plant

nounced just as the company's sc-

Taking over the plant is United Peripherals, the juint disc drive manufacturlog operation set up in 1979 by Data Recording Instru-ments and Control Data subsidiary Magnetic Peripherals Inc. The deal does not include an undertaking by UPL to employ any of the ICL staff, although jobs should he nvailable for some of them later

The takeover of the Winsford factory will save hoth time and money for UPL, which originally planned to build a 150,000 square foot plant at Crewe near its existing temporary premises where 450 staff are employed at the moment.

If these wish to stay with UPL they will have to travel to Wins-

likely to be disrupted

DISRUPTION of government VAT, phone bills, customs and

excise and car tax.

Crewe and where re-equipment by UPL will follow ICL's vacation of the site in July.

By the end of 1981, the UPL workforce at Winsford is expected to stand at 800, including some staff transferred from the other UPL manufacturing nperation at Staines which is being run down as part of the company's rationalisa-

Most of the 380 Staines workforce is expected to accept redundancy rather than move to Winsford, so the disc drive manufacturer is likely to have jobs available for a lot of former ICL em-

The activities of DRI outside UPL, such as its printer manufacturing operation, will remain at

MPI is 70% owned by Control Data and emhraces most of the big computer manufacturer's disc

Bush points out that similar action in 1979 cost the government 5500 million in lost revenue. He

adds that systems involving

payments out to the public such as social security would not be

Consultations are now going op

with members on the feasibility of different courses of action and re-

percussions they would have. A final decision will be made in Feb-

central to the dispute is the de-cision by the government not to follow the recommendations of the

Pay Research Unit, which com-

activities. MPI owns only 24% of UPL, the rest being held hy National Enterprise Board-owned DRI, but it exerts a dominant influence ovet its management, & D resources in the US.

The first two UPL products are both MPi-developed units that the company already builds at its plant in Okiahoma City. They are the 9427H cartridge disc drive which comes with one fixed and one removable platter, each holding six megabytes, and the 9448 cartridge module drive which combines a 16 megabyte front loading cartridge with 16, 48 or 80 megabytes of

fixed disc capacity.

Funded by the NEB to the tune of £8 million, UPL builds drives for sale on a world-wide basis both by DRI and the OEM side of Control Data. The transfer value of its products in 1980 was £17 million, according to Control Data, and a figure of £28 million is planned for 1981.

Also, if after the British Teleommunicationa Bill is passed the Industry Secretary uses tha power it gives him to de networking product in volume nationalise Cahle & Wirelass, GEC-Mareuni regards itself as the most appropriate purchaser.

Delivery is estimated at between the most appropriate purchaser.

GEC plans satellite comms Net/One service

TUNIVESSII CF . G. C.

GEC says it wants to run a worldwide multi-function satellite communications service, combining direct hroadcasting with enumerer and telephone links and having spare capacity for military communications.

Sir Robert Taiford, managing director of GBC-Marconi Electronics reveals his sime in customer BRITISH Telecom is the first it customer for Net/One, the key networking system announced it year by Californis-based User mann-Bass (CW, October 18, 1989)

Electronics, reveals his aims in an interview in the project man-agement magazine Achievement, at a time when a Home Office working party is about to report on the aptions for and implications of a UK-operated satellite, and Professor Baesiay of the London Business School is to report to Industry Secretary Sir Keith Joseph on the likely effects of privately owned communicadelivered in the first week in Richard hy Ungermann-Build newly-appointed UK distributed Thame Systems, formerly Mean Systems, of Thame it of privately owned communications services operating in com-petition with British Telecom.

GBC has wide experience of supplying systems for satellite communications to Cahlo & Wireless for networks in Hong Kong, Bahrain and the West Indles, as well as to British Telecom, and it would like to use the experience to operata s

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BT's order is for a £17.00

three-node pilot system with at serial ports, and it is due to k

BT is to use the system and

Thame Systems was chosen a

linking multiple micros and mis:

and later plans to add mainirans.

distributor because it had alread become top UK distributor for it.

micro maker Zilog before Rahi

Ungermann and Charlie Bas fr

to statt their networking system

orders in the pipeline and another 20 serious UK inquiries for Mr. One, which is claimed to be in first processor-independent loss.

Thame now reports cight mor

Number 741

Thursday, January 22, 1981

Price 25p



that there would be similarities be

tween the Luthian system and the

Thames Valley operation, which is

also based on Honeywell kit, and revealed that talks had taken place

biween the two forces.
The National Council for Civi

Liberties, worried about the

spicad of police intelligence

systems, ja drawing up Parliamen-

tary questions for the Home Secre-

tary to try to get more details.

The DPS 8 at Edinburgh will be

the heart of a network of terminals

at police stations all over an area

DATA PREPARATION We have the capacity to

CAP chief quitstoback Microsoft

A "DEMERGER" at giant British software firm CAP has separated its micro arm CAP Microsoft from the parent company, lesving the new aubsidiary to stand on its own feet under the leadership of CAP's foundet Alex d'Agapeyeff. CAP's other founder member, Barney Gihbens, is to take over d'Agapeyeff's chairmanship, although each will remain a ditector of the other's

What d'Agapeyeff describes as a "very logical development" will almost certainly come as a great relief to many members of the parent company, who have watched with increasing slarm CAP's profits heing swallowed by Alcrosoft's development budget.

CAP is quite open about the conflict of interests hetween

consultancy and their entire range of systems software from the same

source," explained d'Agapeyeff. Despite this uneasy relationship, the hoard presented a united face at Friday's announce-ment. Far from d'Agapeyeff being "pushed out", it was made clear this was a satisfactory arrangement which hinged more on a reorgani-sadon of floances than any real change in the running of the com-

panies.

CAP is effectively writing off its investment in MicroCobol, although the group will continue to

support the language.
The enterprise d'Agapeyeff Is isunching has already cost over £2.5 million, and has consistently dragged down CAP's profits.

onflict of interests hetween Microproducts (as the new company will prohably be called) and shareholders. CAP's senior em-

15% and 30% respectively.

The new company will be owned by the existing shareholders in the same ratio. CAP is likely to keep about 1,000 of its present 7,500 shares and distribute the additional shares in cash, leaving the NEB with a stake in the region of 11%. According to new chair-man Barney Gibbens, this is the first time a demerger has been attempted under the 1980 Finance Act: the redistribution of shares has yet to be approved formally by the 'shareholdera. A number of CAP's leading lights, including Es-mond Hart and Chris Hewkins, will be throwing their lot in with

the new company.

D'Agapeyeff has resigned control of CAP without regret, to

Turn to page 3

Alax d'Agapeyeff (front) is leaving the CAP chairmanahip to Barnay Gibbena becauss of his belief in Microsoft

IBM profits hit \$3.5bn had been predicted, with investor

'Criminals only'

police system

AN intelligence system similar to the controversial Thames Valley Police network is heirig act up by the Lothian and Borders police force on a Honeywelt DPS 8 mainframe. It will be installed at the force's Edinhurgh headquarters.

Recognising the questionable sature of the Themes Valley

yatem, which includes unsubstan-

ated information on people with

for the Lothian force emphasised that the Edinhurgh system would

maintain records only on "active convicted criminals". The biggest

application would be a crime re-

porting system matching criminals with details of unsolved crimes.

He said, "We are alert to the problem of data protection."

riminal record, a apokesman

pledge on Scottish

1BM's results for the year ended December 31, 1980, released this week, show that the company's turnover was up from \$22,863 million in 1979, to \$26,213 million for 1980. The 14.6% increase in

turnover was accompanied by an 18.2% increase in profits, from \$3,011 million to \$3,562 million. 1980, during which many com-panies began to feel the pressures The figures show that \$13,787 millon of the turnover came from outside the US. In contrast with the 50/50 split between turnover inside the US and turnover abroad, 64% of the profits, a total of \$1,902 million, came from abroad. This high dependence on

The company gave no predic-uons for this year, Opel merely noting that "in spite of a right eco-Last week IBM arranged a \$200

tion such as computers in use for

Chicks distributions link





Christopher ... "Government has dailbsrately caused this confilet."

Japanese software for Europe

IBM compatible systems software from Hirachl in Japan is to he sold in the US and Europe by National outside the JBM compatible varsions of Advanced Systems, the firm that sells IBM compatible varsions of Hirachl's big mainfrances.

If any customer is interested, NAS is also prepared to install and support VOS/3. Filtrachi's, own operating system for its eliminates a lot of the definition products already sold by Hirachl to the IBM community in Japan.

Asked about the prospects for VOS/3 in this country John Clements, managing director of NAS will be shorthand Cobol, a pre-processor that eliminates a lot of the definition products already sold by Hirachl to the IBM community in Japan.

Asked about the prospects for vos/3 in this country John Clements, managing director of NAS will be shorthand Cobol, a pre-processor that eliminates a lot of the definition repetition involved in Cobol supporting the system if any user wished to adopt it.

Heart transplant

ORAGE System about all Cluster

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Itel totters into bankruptcy

US LEASING glant . Itel Corp want to a local district court as filed for bankruptcy in San Fran-cisco at 9 am on Monday. The action followed a series of meet-ings between nustomers, ored-itor hanks and the board of the e ompany which began last

Thursday.

Want to a local district court as automated in formal Chapter XI proposals for winding it up. This allows itel to continue trading in a similar way to receivership in the UK.

The same of Ital's demine.

Thursday.

As late as 3 on on Friday customers of the company ware still signing firm term extension agreements with Itel and representatives of Lloyd's of London.

But the board decided that in short the board decided that in ranged flexible leases, is far from the street of the second that in ranged flexible leases, is far from the street of the second that in ranged flexible leases, is far from the street of the second that in ranged flexible leases, is far from the second that in ranged flexible leases, is far from the second that in ranged flexible leases, is far from the second that in ranged flexible leases, is far from the second that in the second that it is the se signing firm term extension agreements with Itel and representatives of Lloyd's of London.

But the board decided that in the face of a \$54 million trading over.

Lloyd's of London, which in a balance sheet that showed the sured the secondhand value of the last nine months and Lloyd's of London, which in sured the secondhand value of the lease machines should cumillion, it could not continue trading.

Without any formal amounce—with Itel. Over \$200 million trade of the secondhand value of the secondhand v

ment lawyers for the company • Turn to page 8

Tha saga of Itel's demise

NEB makes 552% on sale of Systems Designers stake

THE Independent investment Co. clear last year after Industry Sected UK firm with shares in US compared like Apple and Centronics policy of divertment (CW) Sephas bought half the National En. reinter 18, 1980). The NEB sold terprise Board's 26% holding in Systems. Designers International the whole of its holding in Case & CW, January Ltd. The other half has gone, to 8 several pension fulfles prinaged by the turn of the year (CW, January 1974) and Sime of Edinburgh, the same firm that manages IIC sports. The next computer firm experted to be hived off to the prinament in the manages IIC sports. WBB currently owns 79 9% tettin on its original investment. Systems Designers with help the NEB's sale of its Systems. The NEB's laster was described by Systems Designers with help thoughters shares comes as no sut-

Designers shares comes as no sur-prise for intentions were made. Turn to page 3

BRIEFING...BRIEFING...BRIEFING lay-offs announced last November (CW), November 27, 1980). A spokesman said no further euts

IBM New Year plans

A CLUTCH of early year sn-nouncements from IBM General Systems Division includes a "Statement of Direction" from the 38 over the next three years. They include support for Systems Nerwork Architecture on the System 38 in RJB mode.

Series 1 enhancements include

nauld plant, in addition to the 355 by tomorrow, January 23.

Lightning strikes

FINANCING THE COMPUTER

One of the citones of the com-puter tricle is that computers are cost effective. But in order for the things to be harnessed into making savings they must first be properly financed. Turn to pages 16/18 for advice in this week's Finance Supplement.

ALSO.

overseas earnings to provide the profit explains the cautious re-action to the figures on Wall Street, where the shares moved less than \$2 on the announcement. Fax to Amsterdam New York commentators deset bed the figures as roughly what

INTELPOST, the Post Office's international facsimile transmission service, has been extended to Amsterdam, and six Canadian el-tics have been added to the original link between London and Toronto hich started up last summer

second local communication among up to 16 machines.

86 more jobs lost

BURROUGHS has decided it enternated a further 86 jobs at its Cumbernauld plant in additional ment is record.

INSIDE THIS WEEK'S CW . . .

Computerview Letters to the Editor, Shipowner backs higraria....

JOB OPPORTUNITIES: Pages 22-47

Turn to page 3

for Data Capture and Local Processing

and of the 2600 range of nompatible VDU's. The 2684 provides a full 64K bytes of user RAM, supporting industry Standard CP/M operating system with in built 280K byte floopy disc drive:

to eddition to the disc processor system a separate VDU processor provides all the features of the 2634 terminal

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stretching from the Forth to the English border and encompassing a population of more than one million. There will also be links with the Police National Computer

exercising caution because of the EEC anti-trust suit, which IBM has to answer within the next two Results fur the last quarter of

John Opel, the company's new presideot, as "greater than had been anticipated earlier in the

nomy, incoming orders and nents continue at high levels and showed moderate growth over 1979, with the year-end backlog incressing over that of last year".

British Made Terminal

COMPUTER WEEKLY

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EDITORIAL

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THE ROPTOR velcomes letters common the ROPTOR velcomes letters built in the result of the result of

COMPUTERVIEW

Japanese **U-turn**

WITH the announcement that yot soother Japanese company is to launch its persons!/ business computer on the UK and European market, it seems the Japanese are keeping to their proven rule - persistence psys in the ond. Despite opposition from national governments, Japaneso exports of personal computers into EEC countries have risen from almost zero to 1,000 units a month in

Now, after constant denials that the PC-8000 would be introduced to the European market, Nippon Electric has done a U-turn and plans to launch a personal computer system based on the PC-8000 in the UK and Europe at the end of this year.

The PC-8000 was revealed to visitors to last year's Compec. Over 300 inquiries came from dealers, distributors and visitors, according to NEC, and this is the factor that persuaded the company to alter its plans.

Aiready, three other relatively small Japa-

nese companies have become exporters to Europe in the personal computer field. They are Sord Computer Systems, Al Ricctronics and Logic Systema international, all based in Tokyo. Intentions of all three are to become esporters to the US early this year, initially in small quantities. However, they expect sales to increase rapidly as they have

One factor that must be causing a great deal of anguish to Japanese manufacturers is

import restrictions. The quality and reliabil-ity of Japanese products make them very competitive, and the inevitable reaction of European countries is to impose restrictions ss France is threatening to do. France has alresdy warned the Japanese government (mentioning Sord Computer Systoma in parucular) to restrain its exports.

But the Japanese persist. One good way of overcoming import restrictions is to set up an assembly plant in an EEC country, and Sord has done just that.
Assembly of its microco

has begun at a small factory in Dublin. The units are shipped in the UK through two distributors, Exleigh Business Machines of Penzance and Midas Computers. According to Sord most of the assembled units from Dublin go into France, to two major cus-tomers, the French Ministry of Defence and the French National Bank. (No wonder France wants to impose restrictions!)

Which other Japanese companies will follow Sord? NEC could easily, as it already plans a UK semiconductor plant. Only four months ago it was announced that NEC was plumning a 64K RAM and 16-bit microcomputer when the same in I because puter plant at a site in Livingston, near Edinburgh. It will operate under the name of NEC Semiconductor UK and be fully operational by 1982.

Even more ironic is that Livingston is a "special development area" and NEC will receive financial assistance from our govern-ment. In a way the UK, far from strengthening its indigenous personal computer manufacturing industry, is financially assisting a Japanese company to take a part share in the market.

Viewdata

A WELL OVERDUE move for mombers of the emerging viewdata and teletext industries to work together got under way last week at a conference organised by the De-

The next stage is to get those members whose previous marketing efforts were des-cribed by Information Technology Minister Kenneth Baker as being unco-ordinated, to agree on a common atrategy, despite the fact that many of them are rivals.

Last year the Dol brought the teletext industry together in an awareness campaign which started with 15% of adult consumers knowing about teletext and reputedly fin-ished with 50% knowing. At the same time, sales of teletext sets reached 120,000.

This year the sield has been broadened to include viewdata, which has already had a big push from British Telecom and is beginning to enjoy success in small specialised markets, as well as continuing sales over-With any luck the field will quickly be

broadened further to bring together other aspects of information technology. Perbays cable television and two-way radio will be seen to be related - after all, they are an important part of the US market and a major target for UK-based viewdata and teletext

And since the export success of his dustries is expected to benefit has velopment of the home market, pelastic velopment of the home market, pelastic solution of the home market, pelastic acceptance of the personal personal to accept the personal Packet Switched Service, comme each other symmetrically at s very speeds, call each other and same automatically, attach to computer other devices and link to radioples; vices for mobile uso - in fact, be the of o multi-function terminal.

The Telecommunications Councils go at creating a forum for interest up as computer, mobile radio and telem nicotions companies and their usen may still succeed.

Other focal points for hopeful as are: The Dol'a information technology than and its enthusiastic new Market British Telecom's telematics division Humo Office's working party on and and Professor Beesley's report to the try Secretary, due shortly, oo the line liberalisation of British Telecom's a poly.

But when will these combined eligi-able to bring us Space Invaders on view Will the viewdata industry see any day in the International Standards Our tion's work on Open Systems Internation; the ability to connect anything us thing? And can the focus of attention moved on from the rich picking of terminal equipment market to the mus ket for services to which cheap multi-tion terminals can provide when



Towards bank automation

Entitled Microtechnology: A Programme for Actioo, the document includes a model agreement on new technology, modol guidelinos for the operation of VDUs and a new technology assessment form.

It emphasises the need for propor implemontation of now technology to avoid further economic depres-

Analysis of the first

member of H-series

produced a booklot describing microelectronics in the bank in an effort to encourage banks in the UK to reduction in the number of bank branches and a 10% reduction in bank staff throughout Europe, BIFU says.

It has been predicted before, says BIFU, that the number of front office workstations in bank branches in Europe will more than double during the next five years. Some 22% of customer contact positions in Europesn banks are now automated, and this num is expected to rise by 44% by 1985 and over 60% by

of ICL-based bureau AS backer for the ICL based bureau Systemsolve, BOC has been replaced by Hunting Gibson, as a batch bureau and was not as a batch bureau and was not been replaced by Hunting Gibson, been replaced by Hunting Gibson, s £12 million publicly quoted comhappy about holding only a minority interest in the company. He said that BOC had made "a substantial capital gain" from the sale of its shares to Hunting Gibpany in the shipping and broking

Shipowner replaces

BOC as backer

Hunting Gibson has bought BOC's 40% halding in System controlling interest by acquiring some other Systemsolve shares. Total value of the deal was just Last year the BOC Datasolve bureau disposed of its own ICL 2972-based service to concentrate over £1 million.

Hunting Gibson lias no previous on IBM-oriented aperations.

Systemsolve's bureau, located esperience of the computer indusnear the BOC Datasolve centre at try and its company secretary, John Smith, said that all decisions Sunbury-on-Thames, operates two ICL machines, a 2903 and a 2905. about Systemsolve's strategies would be left in the hands of its Turnkey systems provide n high proportion of the company's esisting bosses. But Smith will sit revenues, with ME29 work becoining increasingly important. Systemsolve managing director John Stanley said that BOC was no langer making new financial investments in his company and that it was apparent BOC had no lace for successions. Software packages for ICL

Systemsolve's turnover is expected to grow from £2.45 million in Its financial year onded September 30, 1980, to £3 million in place for Systemsolve in its

This view was supported by remarks from Colin Southgste, chiof esecutive of BOC Data Services, pre-tax profit of £1.5 million on a semiconductor materials.

SYSPAK/70

Hunung Gibson is one of three separate publicly quoted fluoting companies with engineering in-terests and historical connections.

BOC's interests in the compute services business are among the biggest in Europe. Apart from BOC Datasolve it owns Software Sciences and the personnel com pany Knight Computer Services.

Electron beams supplant heat

A BRITISH company, Lintech In-struments of Cambridge, has developed electron beam equipment for use in the manufacture of somiconductor devices much fast than the present thermal techniques. The electron-beam annealer called Seza in its production form the current year. will have a throughput of 200 wafers per hour for ion-impisment will have a throughput of 200

LETTERS to the EDITOR

Separating information from raw data

formation if it is used. Information

cannot use is not information, it

This does not mean that it may

not be information to someone

else. How often do managers be-

moan the fact that some vital piece of information never reached them because someone else did oot think

The information that Michie

1984 and all that . .

NEWCASTLE-UPON-TYNE

A 150 kevestion PCK system is required to depture 3 million prescriptions in the first of the Authority's 11 processing divisions remainder by July 1982; and the

s, to put it politely, just data.

I SEE from the articles by Messrs E) that there is still no shortage of gentiemen to discuss earnestly gels-that-can-dance-on-the-head-

would appear that they are using "information" in its technical

With an information we are

With an information we are guessing, with incomplete information (the most common state of affairs) we hope to do better than guessing and perfect information hardly ever arises in real management situations.

In these circumstances, a better definition of information is given by Beer as "That which changes us" i.e. ". causes us mehave decide differently from how we would have behaved/decided without that specific input"

Sufcliffe(Shannon sense)

Sufcliffe(Shannon sense)

The manager's 'veryday environment, which is a part of Professor Michie's open system, is a sea of technical/distrinctivnamic type 'information'. This may be considered to be 'latent dath' in maragerial terms.

As a matter of routine, request or chance, someone goes out idito the environment and collects some of this latent dath. In this becomes they have goes out of the character of this latent dath. In this becomes they have goes out of the character meaning out of the riw.

The address was recognise and extract meaning out of the riw.

Michie and Sutcliffe (CW, January we only really know that information has been received if someone-did-change-his or her actual state (and possibly other people's as well) as a result.

Thus, information is only information if it is used. Information

of-a-needle" type. As a new reader, I have not had the pleasure of seeing Professor Michie's definition of "information" but from their discussions it

while this is fine for Shannon's Information Theory and for work involving thermodynamics, it is not so useful for managers concerned with everyday decision-

and Sutcliffe are discussing is only a precursor of the information the In its managerial sense, "information" is what we need to make decisions. manager uses. How relevant are their discussions to computers and managerial "information"?
The key siep from raw data to managerial information depends

upon two things;
Its ability to fulfil someone's needs, and ability to extract and recognise what is useful/relevant.

Computers can dertainly be used to assist in the collection of raw data out of latent data; and even to collect it where it was not possible previously.

They can certainly be used to

out that specific input?

The key is that information is managerially useful.

**How does information in the managerial sense relate to information.

THIS week's example of the strange things people say in the media about computers was scot in by David Howe of Ashby-de-la-Zouch, who wins The computer keyboard operator taps out the story and in doing so sends electronic impulses to be registered on essettes, onlied

NHS COMPUTER REQUIREMENTS PRESCRIPTION PRICING AUTHORITY

TEN YEARS AGO From Computer Weekly of January 21, 1974

If computers can be used to ex-

tend our ability to extract useful information and hence perceive meaning in our surroundings, that should be sufficient to qualify them as useful.

Whether nr not computers can ever have infinite capacity has an real relevance to their usefulness to

a finite population of people. Furthermore, prolonged discussion about whether the computer

creates or merely assists the collec-tion of information is irrelevant to the person who needs the informa-

If my comments achieve no nther result, they will no doubt provide Messrs Michie and Sut-olific with something to agree

D. C. SUTTON

Management Analyst

Goalville and Ashby Time

REVEALING picture of bow Vhitehall and Westminstor em-

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Announce the

ploy computors and envisage their future emerges from the long-awaited Civil Service Department report, Computers in Central Government Ten Years Ahead which shows the Minister. data and it becomes information in assist in the extraction of informa-Ahead, which shows the Ministry of Defonec heading the list of present users. Looking to the tion out of raw data. Computers cannot by themselves recognise what is useful, nor selves recognise what is useful, nor can they by themselves define needs. Only people can do that.

The number of people in the world is limited, as is their individual ability to extract ioformation out of data. future, the report foresees cumulative hardware investment of contained in a recest New 2000 million by 1980 with govern-

20-fold over the period British Rail Scotland has one another £300,000 MARCH train doscription aysten k gow Central to complement earlier installation at Motes . . . Snune 85% of computer dn not provido specific be fur software purchase, a fa

AN analysis of the IBM 3081, gooerally accepted as the first With the title, Evolving the IBM Network, the event will also

> Other topics will cover areas auch as IBM's directions in tolecommunications and office tech-nology, and its strategies for operating systoms and databases. Discussion of the 3081 will consider if the machine will be made obsoloto in two or three

yaara' time by naw H-series com-

feature a talk about naw aspocts of IBM's Systems Network Arch-

ware like MVS, VM, VSAM and

the echwill be in IBM Group's mamber of the long-awalted Hseries, will be included to a twoday conference in London on
Fobruary 16/17 organised by the ference will be the latest in the Yankee Group's European Techoology Updste serios. It will be lod by two well-known IBM watchers, the Yankee Group's own director of market research. own director of market research,
Dalo Kutnick, and Dr Dixon Doll
who is rotained by IBM as a
training consultant despite bla
public pronouncements and predictions about IBM's atrate-

Further informaden about the event can be obtained from either Al Dunn or Gwendolyn Thomson, CAS The Yanker Group, Regal House, Lower Road, Chorleywood, Rickmansworth, puters capable of aupporting future versions of systems soft-Herts, WD3 5LQ. Tol: Chorley-wood (09278) 4714.

Timeplex: alleges that Racal allowed its US-based manufactur-

ing company to use protected Timeplex technical information and plans to develop a rival range of atatistical multiplexers.

Further, it alleges that Raca

Timeplex sues Racal

US DATA communications manufacturer Timoplex has started legal proceedings against its former exclusivo European distributor Ra-cal-Milgo (CW, October 23, 1980), alleging misuse of trade sectets and breaches of various agreements. In preparation for arbitration in

New York City, Timeplex — broke a supposedly non-cancella-broke bet up a UK subsidiary early last year — has asked for court sutherity to question Racal employees under oath and to examine company records:

In preparation for arbitration in Further, it sueges that Kacal broke a supposedly non-cancellable contract to buy \$1 million worth in equipment due to be delivered by the end of March, failed to pay for other purchases and miscompany records:

IBM profits up to \$3.5bn From front page

millioo loan in the Eurodollar mar-

Ing.
The current loan is on behalf of the IBM World Trade Corp over-IBM has traditionally been a net seas unit. The interest rate of the geogrator of its own funds and, soveri-year loan, unconfirmed by taken with the surprise billion dollar borlar 1979 borrowings, the current favourable level to Eurodollar borload takes the company into more rowers. CAP chief quits for Microsoft

Pit all his eggs in the Microproducts basked. It has been very much his "baby since its begin plug in 1976, when GAP's back room genius Bimond Hart promised a Motorola 6800 linked rammed a Motorola 6800 linked system, BOS, along with it.

But though the user can swap sying fise it the whole idea of portable software. Since then, CAP so its la limited to CAP Microsoft has absorbed most of Agapteent Sconsiderable chergy range of products it he wanted the software the software of the software in the same discassing the wanted so its la limited to CAP Microsoft.

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A language of our own

to using technical or scientific language when talking about everyday things. It can be extre-

For example, I have been sitting in restaurants with colleagues, and as the waitress turned away said, "And a plate of clups". This elicited no visible response, and we would wait breathlessly to ace whether the

One of us would ask, "Do we have a data entry failure?" to which the reply would be, "Seems to have been a

Of course the problem with this language is that you cannot use it with outsiders, but I often wish you could.

For example, I am baffled by the isms one gets in tube trains during the rush hnur. People can be squashed like steam-rolled sardines near the doors, while others are standing oblivious in the middle of the cars with plenty of apace around them, reading their reading their newspapers.

There seems to be enormous friction on the movement of people, even under severe pressure gradients. The people half way in between have plenty of newtons shoving them from

LAST Privateview left the question: what is an information structure? Also, can you ereate one without creating information?

The decision ten of Floure 1 displayed in Floure 1 in the private of the game. So only some of the 91,877 bits' worth of informationally equivalent structure into another? Figure 1 with its supportion graphs of Figure 1 in the private of the game. So only some of the part of the part of the game. So only some of the part o

displayed in Figure 1, it too is an information structure. Some will

Equivalent

With respect to the possibility of Black's drawing this lookup table

contains exactly the same amount of information as each of the

The pswn is a rook-pawn and canim is achievable.

Martian information structures

MICHIE'S PRIVATEVIEW

considered harmful

The decision tree of Figure 1 answera questions about the complete set of legal king-pawn-king positions in which Black is to move. When processed by machine or interpreted by hand it will deliver for any auch position the information whether the lone king is lost or can draw. After allowing for symmetry, there are 197,992 legal KPK positions with Black to move. Of these, 61,787 are lnst and 36,205 are drawn. Viewing the decision-tree as an in-

Viewing the decision-tree as an in- ately been dressed up as a data-

be no more than the code for interpreting ordinary conditional expressions. Also needed are mechanisms for evaluating the six attributes corresponding to nodes. These take the form of "subrouting trees" of the main tree.

Another information structure is the complete machine tabulation (programmed by Michael Clarket for king-pawn-king, from which the same answers to the mossibility of the receivable by lookup.

formstion source, we apply stan-dard theory to credit it with 91,887 bits of information with respect to the LOST versus DRAWN classi-

fication. The tree-interpreter need.

be no more than the code for in-

tine trees" of the main tree. Figure 2 portrays an algorithm

which computes exactly the same

result. It performs exhaustive lookahead and lience is only time-

fessible for positions lying near the

LOST

Bellows of "Move down inside I" have little effect, and I fear that explaining about the scientific awareness

pressure gradients would have less. Just pushing elicits nothing but indignation.

Another yawning gap in the

Or perhaps it's just good old British bloudy-mindedness, which I gather has had a preser-

Quibblers of the DP world unite!

SOME anonymous person at Hull College of Higher Educa-tion (are they basically self-effac-ing in Hull?) has sent me a cutting from our ainter journal Systems International about a new Harrls mini.

Saya the story, "Included in the price of the 24 bit system is 6 M-byte of virtual memory, a

semi-automatically by Niblett and Shapiro using the Hunt-Quinlan

program iteratively sampled Clarke's database and selected

from it tutorially powerful examples for self-administration.

The result, as can partially be verified from Figure 1, makes ex-

cellent sense to the chess expert.

Hence it would be legitimate to speak of its contained information

as consituting "knowledge", since it possesses the human-friendly as-

pect that we recogniae by that term? So although ID3 has not

created information, but simply re-cast what was already in the lookup table, new knowledge has undoubtedly been minted from

Clarke's previously excavated nug-

In a second run the experiment-

ers withheld humae guidance, so that ID3 was obliged to construct a

completé single-level tree from lta

own resources. As a source of full and accurate information the re-

get of raw information.

f information as each of the sulting decision tree was at least equally machine efficient. But to the chess expert it was gobblede-

BROAD MEANING OF ATTRIBUTE

cann le a spacific pattern which antalis that however Black moves Whits can promote the pawn without moving his king.

melop entails that the pattern mainpatt either holds of is achievable.

The pawn is on rank 5 or 6 and the pattern rank spatt holds or is so hievable.

The pawn le on rank 7 and the white king can force its way heat to it.

Mulual Interference operates between blockability of panin and mains:

ments: "Payable in Monopoly

Personally I find rather fascinating the idea of having to pay money for memory which isn't

The reaction of my colleagues

on Systems was, naturnlly enough, "Stap quitbling, you know what we menut!" But we computer people are the world's

ace quibblers, are we not? line voice response systems vate viewdata, the feet channel would come by What with virtual machines and virtual terminals, I linve heard more than one data processing manager wish that he had

telephone lines, the pheralded wonder of the it tion age, Prestel viewing. to be in disconnect make.

Dr Adrian Stokes such book, Viewdata - a his formation Utility, that its has been around for a me time without appearing big

starting grid.

munication channels.
The first feasibility is introduced by the Pest of 1972, an in-house dense staged in 1973, arandarism 1975 and pilat trials begin;

Pushing This trial was fallowed by

ket variety in 1977 and the vice a year later. Had such timescales mi data processing, the isy. just about be getting their.

The rest of the world been altting on the commit-sidelines. While Prese's development and staffing k and loses the support of nsera like Curry's and an nay, the French Tell. Canadlan Telldon system

pushing hard.
The Irrepressible Free hoping to set the pact with plan to issue CRT keyboots nals to all domestic with Similarly, in the United the "challenge of cheet ology" appears more stp.

than a threat.
With the multiplicity of peculiar and telephone negotions the absence of a postal need. there are already severi m ng information services of in the US.

Misfortune

As might be expected systems are designed in its to 80 far beyond that it "electronic yellow page to EFT, home banking, procomputing games plus mail-box services are all the in the home information me

One area, where the life lead is that of excuses. The viewdata progress, is he equally between British Texas.

TV manufacturers, incases. users and sustanters.

Prestel suffers the polymatorium of being the majorium of being the and as such as had more

The latest directions buildness users. Strangely CUGS (Closed User Ground being urged to take advantable nationwide. Presed as

gook and might as well have been In laboratory experiments at east, the machine learning problem is on the run. In consequence

Professor Donald Michie

laboratory analysis of chess to advanced robotics seems obscure. Tu

Transparent

Machine acquisition of classificatory strategies is critically relevant to robot vision, robot action-planning, assembly sequencing and industrial scheduling. New and sharper variations arise of old issues. When, for example, does a given requirement call for the nugiven requirement can for the nu-merical and combinational ap-proaches of classical control engi-neering and operations research? When should methods be tuned to the user's need for transparency? To some the path from

tion structures of Martian coinage?

Or is there a necessary place for

who engineer such atructures to lie within the "human window"?

heed of the Machine Intelligence Research Unit at Edinburgh Uni-

me it has nhvays seemed ahort and

Clarks, M.R.B. (1977) A quantila-

the following question acquires ur-gency. Much as it might delight certain well-meaning physiciats³, should we be happy to see the ro-botics scene flooded with informa-

the study of king and pawn against king. In Advances In Computer Chess I (ed. M.R.B. Clarke), Edinburgh: Edinburgh University Press. Only LOST-DRAWN information from the table is relevant formation from the table is relevant

Niblett, T. and Shapiro, A. (1981)
Automatic induction of classification rules for a chess end-game.
Paper to be delivered to 3rd International Conference on Advances
in Computer Chess, London, 9-to
April.

April.
Lighthill,. (1973) Artificial Intelligence: a general survey in Artificial Intelligence: a Paper Symposium.
London: Science Research Council.

[function value position; vars valuellat;

if position, terminal then bookvalue (position)

sizes position, whitetomove then maxval(mepilat(posipdnt/yelue/inputposition)]; goon]

argument types result types ierminsi ookvalue truth-values numbers value-lists

Figure 2. This recursive POP-2 to

Turning on to Prestel

uniter of getting to six-viewdata principles.

Given a choice of inequalities merits of interfacing to level EFT and PoS atmediance to the control of the c

Somewhere along at

TWO major contracts announced earlier this month for data proces-siog systems at the giant coal-fired Drax power station in Yorkshire, have brought more than £3½m worth of business to the Hamp-shire-based Industrial Systema Division of Solartron Electronic

contracts

Solartron

Drax

wins£3½m

Group.

The company has been appointed main contractor for the design and installation of monitoring and control equipment for the three 660MW ateam-turbine generators and associated equipment which constitute the final phase of this

Over 3,000 analogue inputs and One of the three 660MW turbins 7,000 status/event inputs will be monitored by the system. Hardware includes seven supervi-sory computer systems, DEC PDP 11/44s, and 21 intelligent data centres linked with associated peripherals to form a distributed network which uses the high speed data communications protocol,

The larger of the two contracts was for £2.8m and eovers computer-based systems for the collection of operating data from the bodiers, them not only to detect plant turbines and common services, for presentation in the form of an accurate record of the time at displaya and printouts to the which the event occurred.

operators in the control room.

The other contract, for represents an important milestone for Solartron as the company will smaller system to monitor atatus and event inputs at the Drax aubatation, where the power sta-tion output will be transferred to and Construction Division

Storage Tech picks up

Amdahl staff in IBM moves PURSUING its plans to move into on its own profitability. It sees \$50

une of the three 660MW turbins-generator units installed at the CEGB's coeffired Drax power sta-tion near Satby, Yorkshire. Bolar-tion will provide the data proces-sing systems for three similar turbines at Drex.

the Grid. The two data processing

systems will also communicate

nitoring units were manufactured by Solartron and include a

contact changes but also to provide

now be main contractor to the Central Electricity Generating

A large number of the plant mo-

with each other.

the big IBM-conpatible processor business (CW, November 6, 1980) million being needed to develop a marketable family of machines to match the IBM H-series. Power ratings will attent at seven million being needed to develop a marketable family of machines to match the IBM H-series. Power ratings will attent at seven million instructions per second:

Computer Research Corp, it is based at Sunnyvale, California, and already has picked up several key personnel from nearby Am 1981 and should have completed dahl.

Storage hopes to attand by its plan to finance the development plan to finance the development the right to buy the technology company largely from outside from the Sunnyvale organisation sources on a partnership basia in along with exclusive manufactur order to avoid any adverse effect ing and marketing rights.

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Data 100 parent axed in US merger

up to take over the operations of Dam 100 in 1978, no longer exists as an independent organisation. Its Canadian parent, Northern l'elecom Ltd, has merged it with an older US subaidiary, Northern Telecom Inc of Nashville, Tennessee, in which it will operate as a division called Electronic Office

At the same time Data 100 has confirmed that the factory at Cork
in Ireland that builds its 7X range of remote batch terminals and key-to-disc systems, is to be run down by the end of March. Well over

100's Hemel Hempstead plant.
A total of 300 staff are being

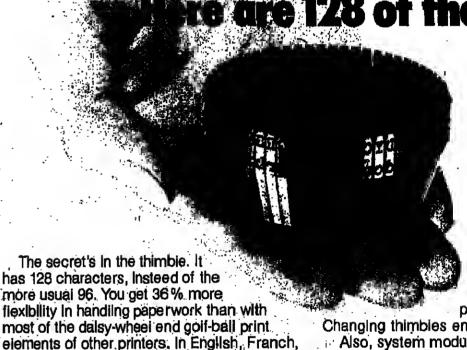
shed in Europe as part of the up-heavals within the former NTSC that have forced the Canadian parent to write \$220 million off its

Manufacturing of Data 100 originated kit will now be confined to the US because most of the firm's new business is generated by the 4XX series of distributed processing systems developed originally by Sycor. This is the other US-based terminal equip-ment manufacturer that Northern Telecom took over about three worth, while user years ago. Sycor's merger with \$1.6 billion worth

The 4XX series is expected to be enhanced very shortly with word processing facilities.

lmbalance in semis EUROPE'S semiconductor output for 1979 was worth \$1.3 billion. although It used about \$3 billion worth, according to the latest regrated circuits: European manufacturers produced \$500 million worth, while users bought around

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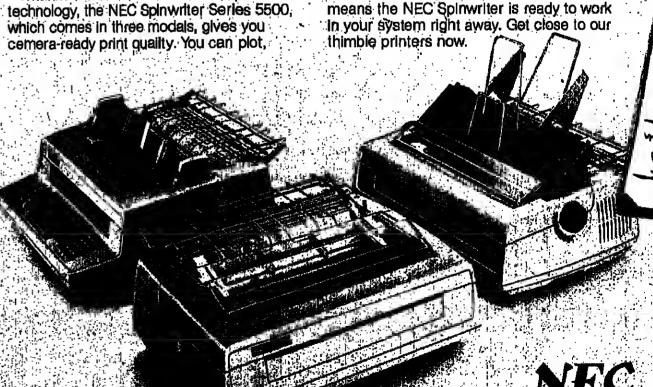
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DIGITAL . ANDERSON JACOBSON . TRANSDATA . A MIJACQUARD . MELLORDATA . NEWBURY LABORATOPIES . TEXAS

Help for travel agents

press is using Prestel experimentally to provide details of fares and timetables on 28 of its busiest routes to and out of London and

Birmingham, During the one-year experiment, which atarted last week, National's marketing deportment plans to monitor the use made of the system by travel agents and see if ticket-issuing is speeded up by

The details occupy 80 Prestei pages within the database maintained by London-based umbrella information provider AVS Intext, A total of 1,352 travel agents eurently have Prestel terminals.

National wants to use computerpased information systems to pubish details of services to all the

BBC spec revised

HAVING shortlisted three microcomputers for use with its forthcoming television series First Byte, the BBC has reissued the

Additional requirements were decided after running a pilot programme and include the ability to lownload aoftware from Ceefax.

AMERICA'S second-biggest tele-phone company, General Tele-phone and Electronics, is prepar-

ing to iauoch a viewdata-type service called infovision which

would carry classified "yellow pages" type information with local

newapapera as franchiaed

been offered to the Washington

Post and other newspapers, and

GTE wants five letters of intent

before it starts up.

GTE, which last year ran trials

use low-cost monochrome termi. I nais designed for the French i electronic telephone directory by Telic, a subsidiary of CIT-Alcatel.

Telic has already concluded one

TV adapters could bring down cost of Prestel

appearance on the market of several television adapters selling for

Tangerine Computer Systems, of Ely, Cambridgeshire, has installed one of its Tantel adapters in each of the 10 Prestel regional centres for demonstrations, and aims to start delivering to mailorder customers by the end of the

400 dealers and is wooing a couple of dozen including television rental companies such as Granada, Rediffusion and Vislonhire.

Ansafone's new subsidiary Vlewdata Business Systems has ordered 100, Tangerine's marketing manager Peter Harding told Computer Weekly, and interest has been shown by potential dealers in Germany, Switzerland, Holland, Relgium and Italy, Angelogium angelogiu Holland, Belgium and Italy. An order for 5,000 may come from

Later versions

Production plans are for 1,000 this month, 3,000 next month and 6,000 in March. Parts have been ordered for 50,000 units, A £200 printer is planned for about two The choice had been narrowed down previously to Sinclair ZX80, Newbear Computing NewBrain or NewBear Computing New Nascom and the target price re- sette recorder interfaces are built-

Source Telecomputing, the home Information service recently

bought by Readers Digest mun-der which it hopes to supply

250,000 terminals over the next

business systems market, showing little interest in selling terminals, and no other British company is reach to sall ligant and the sall ligant terminals.

ready to sell large quantities of viewdata terminals into the US; sithough viewdata chip sets are be-

ing demonstrated to US television

planning "electronic yellow pages" as one of the "information util-

Aregon is concentrating on the

three years.

based on a viewdata systom makers, supplied by Aregon, now plans to AT&T is also believed to be

bullt in and, with measurements of 9in x 61/2in x 21/2in, is claimed to be half the size of competitors' devices. Later versions are planned to have alphanumerie keyboards and interface for connection to a

own microcomputers, but because of the volumes envisaged for Tantel, production has been subcontracted to Brocks of Poole in Dorset, which makes radios for Boots and marine communicationa

The Tantel is based on Mullard's Lucy ehip, which provides the telephone line and peripheral interfaces and works in conjunction with the Mullard teletext chip which is already in use in 120,000 teletext decoders in the UK.

Harding said that the biggest battle his company had been fighting was for credibility, because other manufacturers had announced similar plans for volume production, but had not carried them out. Tangerine recommends a retail price of £170 plus VAT

based on a price to dealers of £125.

A second manufacturer, Radofin, Is also basing its viewdata adspter, the VDX 1000, on the Lucy chip. Alming to start delivering from the end of next month, it recommends a retail price of £199.95 including VAT and hopes to sell 40,000 units dur-Yellow pages on viewdata

However, legislation on commu-nications oow in preparation may

Radofin's own factory in Hong £199 teletext decoder. It has sold 15,000 in the year since its launch. Distribution in the UK is likely to be handled mainly by Advanced Consumer Electronics of Wembley, Middx, which uses the brand

Modification

For distribution overseas, Rado-fin is talking to Telefunken and Saba in Germany and General Telephone & Electronics in the US, but no firm agreements have yet been struck. Potential US customers have not yet chosen between the different coding schemes and display methods used in the British, French and Canadian viewdata systems, but Radofin is prepared to modify its device in these areas as well as to sult the US NTSC colour televi-

The VDX 1000 includes printer and cassette interfaces, but the company also plans a later version with an alphanumerle keyboard.

Mullard expects its Lucy chip to sell as well overseas as in the UK and is talking to manufacturers in Scandinavia and the US. Already

One unmulacturer that has chusen unt tu use the Larry chip, or the alternative viewdata chip se from General Instruments, is Zy cor, whose Teledek 2000 adapter based un National Semicundus tor's SC/MP injero.

Zycor's rensums include the block of a secund source for the specialised devices and the feeling that a dediented chip will prove that a dediented chip will prove controlled consists. plemonting future enhancements.

The Teledek 2000 is recom mended to retail of £200 plus VAT and deliveries have started to mail order eustomera while the company sorts out dealer arrange-

Monitor

Two additional versions are planned for later this year, called the Teledek 4000 and 9000, to sell at £450 and £600. The first is designed to provide a continuously changing display from a built-in eassette recordet and the second includes a 14-inch culour monitor and an optional alphanumeric key-

Oracle Electronics is another company selling a viewdnta half its sales of teletext chips go overseas and total production so far is expected to reach two million devices next month, having adapter at the slightly higher price

Now hear this

A VOICE controlled Prestel terminal was demonstrated at the National Maritimo Institute conretence in London.
The conference was designed

running such a service.

These and other proposed services are described in a report called Electronic Yellow Pages, published by market research consultant international Resource Development of Norwells Connection to spread the use of new enmnu-nications methods such as Prestel in the marine industry.

Voice input was bandled by a voice data entry terminal, the T600, from Threshold Interna-

velopment of Norwalk, Connectitional Electronics of The report suggests that the electronic yellow pages market will grow to \$5 million this year, \$250 million in 1985 and \$2,500 million in 1990, by which time It will re-

Beaaonsfield, Bucks.

The equipment was assembled as part of the Seaview project being conducted by Liverponi Polytechnic, CAP, Siemens and the Department of Industry in which a multi-function work etation designed for shipboard use combines viewdata and teletery duce paper consumption by 50,000 tons: Participants may inclode time sharing bureaux, as well as telephone companies, cable television companies and publishers. combines viewdata and teletext access with fscalmile and telex

communication via radio and with local word processing and date processing.
The aim is for a database see

land to replace much of the printed documentation currectly

live years ugo Threshold vulco data ontry terminals were installed at the Royal Navy Hydrographie Establishment in Tauntoe, Someraet, for use with computer-sided chart produc-

Recent devolopments lociudo a apeakor verification system, and a speech recognition algorithm which improves input speed and domands less complete separa

Safety conditions

for nine months and factured in the half week by Michael Parliamentary Under State, Welsh Office SPECIFICATION of salety, signalling and display requirements for Prestel terminals has been agreed after a year of consultations between British Telecom, the British Radio Equipment Manufacturers' Association facturers' Association, the Tele-communications Engineering and Manufacturing Association and the UK semiconductor industry.

Designed to Impose minimal restrictions on terminal builders. Ads on Press

A CLASSIFIED at sice for new sul Electronic Bospata
Bath. It appears to
3202190. the specification will be published late next month by the Prestel organisation priced at £10.

Computer the

Aid, the Computer name it gone making the same in steading in computer when, more significantly to determ to exact the baid of his aim of separating the Computer streams facilities and the normal accordance to the property of Computer should be said to the normal accordance to the property of the prop

Wild Contil fore stock of
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Supremely a large stock of
Durabat London particular, bound on the unbarra given to the Yrand Sound and resistant
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for a minimary of brian residuantly, it as no 1981 of
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\$450,000 (1887) \$2.40 yill earn post.

\$450,000 (1887) \$2.40 yill earn \$3.60 pt
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\$550,000 yill earn \$

sidiary, Viewden Burotechnique will have to move ahesd fast 10 achieve a turnover of 400 million Francs and Systems of Cambridge Govt help liss become a distribu the Tantel adapter make a profit out of its 200 million To enhance its chances in an Matra Harris' atske and objective

The Americans view their

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sing and data comme livities in return to the R&D facilities and smill

Combran based on minals within the months. The Sant 80 Pins have been in

Italy's system, be.

1082, is to be insigned this spring for Sprin and Eurotechnique Saint Gobain-Poot-a-Mousson, when he opened their new factory at Aix-En-

semis with a

The image of cut-throat compe-tiuon was well chosen to symbolise the price war and the drop in aales which threaten France's fledgling electronics components industry.
Paul Mirat, chairman of EFCIS.

up and running a he pay, the Vicker on the components subsidiary jointly owned by the irrench Atomic application is the me. Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy Authority (CEA) and formation about the irrench Atomic Energy A for the French government's target of a components industry flying the tricolor flag and able to meet the needs of a national French market worth 2.3 billion Francs in says: "Only cight months ago a sophisticated integrated circuit with a memory function sold for i20 Francs. Today you pay a top price of 15 Franca"

increasingly competitive market Saint Gobain has joined forces offering Taned with with mightly National Semiconguarantee on partial ductor, and Matra with Harris. plans to supply the first plans to supply the first plans to supply the first plans to build up a complete the first ponenta industry with 600 million train of section with the first ponenta industry with 600 million train of section with the first ponenta industry with 600 million train of section with the first ponenta industry with 600 million train of section with the first ponenta industry with 600 million train of section with the first ponenta industry with 600 million train of section with the first ponental p between now and 1985,

French investment as an opportunity to establish a series of bridge-heads which will guarantee them

A SETTLEMENT in long-term markets in France.

Charles E Sporek, head of Wational Semiconductor, explains:

taneously on technology covering CMOS, bipolar, and NMOS. This could enable the huge French firm, which has just taken over the Hachette publishing empire, to obtain a big slice of a market em-

In launching the first Franco-American MOS integrated circuits

for France's national component plan, Matra is trying to minimise

Matra's chairman lean-Luc La-

situation? i don't really know. Perhaps in six months, eight

months or longer". Mothrola

lowdown, the market will pick up

But Motorola is reducing

in the middle of the current year.

working hours at its Toulouse plant, and Saint Gobaln is laying off personnel at Rennes, in Brit-

tany, one of France's highest

Irons in fire

These are discouraging auguries

unemployment areas.

are of the same order.

partnership, says its plan is in innovate and create in every field of components. Chairman Paul Mirat comments: "By defining imaginative products and finding original uses for them, we are bound to win in the end. There is

Matra is now putting the

EFCIS, the Thomson-CEA

finishing touches to an agreement with Intel and Mostek which will

no point in wasting our finances on costly basic technology". Mirat adds: "Let's make the most of our grey matter. That is hope to exceed a turnover of 500 million Francs with a work force of

Price cuts

Americans may follow the example of their Japanese competitors by ruthless price alashing. Business observers who doubt the validity of the alliances signed between the French and US manufacturers, say the transatiantie partnerships could crumble under a wave o price cuts by Nippon Electric, To-shiba, Texas Instruments, intel, Pairchild, Mostek, RCA and Gengarderels working simul-

Thomson-CSF, EFCIS, RTC, Eurotechnique and Matra Harris, would then be powerless to meet these places and the powerless to meet The French Post Office bas

CHARLES SPORCK, head of Netional Semiconductor . . . "We ere right in the middle of the depression and the price war."

promised to buy one and a half billion Francs' worth of semiconductors from this quintet between now and 1985.

plaining about being excluded and are alleging protectionist behaviour. But the Post Office says it is only fair for the government to support firms which are making big investments and running major

France's Miniater of Industry Andre Giraud says: "The Industrial revolution will be achieved through electronics." He looks forward to the day when the French will emaneipate themelves from Americao tutélage in electronics in the same way as they are doing in nuclear power genera-

After an encouraging year 1980, the French components industry is beginning the oew year under the shadow of concern for orders which show aigns of flatten-

ing out during the coming months.

The prospects for MOS are an unknown quantity, after a year during which orders doubled. But-overall sales of components are ex-20% until the summer, compared with an increase of 30% during

key cause of uncertainty about the prospects for the French economy. The government is at present pumping in funds to maintain con-

Rapport for 18 varsities

SYSTEMS house Lugica has scooped a major contract with the Computer Board to supply the British universities with the rela-

tional database Kapport.
The universities will benefit from what a Logica spokesman described as "a generous

Logica won the contract on Rap port's performance when undergoing trials on Birmingham University's Digital Equipment 20 and at other sites on ICL equipment. Portability was also a major factor, since researchers will be able to use the same database on a lorge number of different machines.

Teaching

Rapport will be installed at the university computer centres to activities: teaching and research in database methodology as well as giving engineers, and even re-searchers in the humanities, easy access to cross-referenced informa-

The regional computer centres getting Rapport are Bath, London, Manchester, Aberdeen, Aaton, Birmingham, East Anglia, Hull, Kent, Leeds, Liverpool Loughborough, Queen Mary College (London), Sheffield, Southampton, Stirling, University College Lon-don, Waswick and York. The hardware will include Prime, CDC, Burroughs, iCL, Digital Equipment, Honeywell and Am-dahl.

Rapport is the first commercially released database system to gain a firm hold on the market Logica has already implemented i on a wide range of machines, in cluding Data General, ICL, Univac, Burroughs, Digital Equip-ment, IBM, Prime, GEC, Harris,

Univac joins the wonderful world of Disney

CINDERBLLA meets the computer? Not quite so romantic as Orlando; Florida, has caught up Prince Charming but probably with modern technology with a 19 more commercial (although, come million order for University of the computer of the comp

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Univae is to supply two i 100/60 multiprocessors, 2i of its V77 minicomputer range, including the 200, 500 and 800 models, two System 80s and 300 of a mix of UTS 400 and UTS 4000 terminals. The minis will be used to control air conditioning and control air conditioning and similar applications in a range of buildings in the huge Walt Disney World park. The mainframes will be part of a distributed processing network and will run general business accountancy, hotel reservations, inventory and payroll.

Univec will supply basic software but Walt Disney is to develop much of its own for many of the much of its own for many of the Cindereits's eastle at Wait:
Disney World in Fibrida (plotured right) is to have its takings computerised following a major order for Univac. (Picture copyright Welt Disney Productions.)

题。1867年 Recruitment mergers likely

industry sources suggest more consultants, mergers to the recruitment business. Leading consultancles say the economic climate is inhibiting the integral business offering vacancies and that there are signs the number of skilled people is starting to match demand. As a restit, companies have become more demanding heading I when appropehing feetultment contract per

MDS half-year profits fall

MOHAWK Data Sciences blames. Trivex Corp. The terminal was in technical difficulties with its iBM tended as one of a family of IBM compatible Trivex 80 terminal for 3270 compatible machines. Early slight decline in profit ib the half versions of the Trivex 80 devear ended October 31, 1980, from veloped faults, allegedly in externally supplied components, but these are now claimed by MDS to interpretable machines are now claimed by MDS to interpretable machines are now claimed by MDS to interpretable machines.

A recent indication of a shakeout among the consultancies was
the integration of Thorpar Reintigration of Thorpar Reintigration of Thorpar Reintigration of Thorpar Reintigration of Thorpar
wices with Inducon.

Mike Thorne; former [Thorpar
managing director, is now
heading Inducon's DP and

Wilkes Computing For DEC SYSTEMS VAX 11/780 PDP 11/70, 11/34's, 11/44's

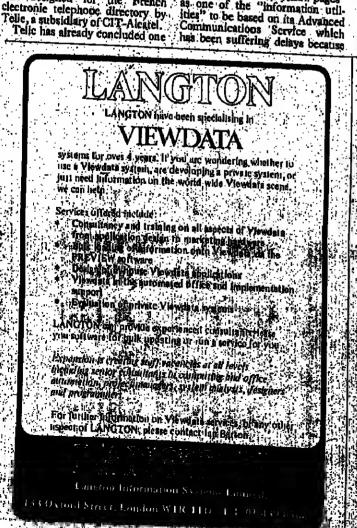
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Award for

business

brainwave

AN AWARD of £300 has gone to

Mike Rees, a research assistant in

electronic engineering at University College Cardiff, for a data

communications interface for use with the Commodore Pet desk top

The competition, organised by the Welsh Development Agency, aimed to find the best business

idea from university researchers. The interface is needed to connect

The interface is needed to connect the Pet to a Post Office approved modem so that data can be transmitted via telephone lines. It uses Zilog's Z80 8-bit interopro-cessor which enables the system to monitor the status of the modem,

by Eileen Stainer

Holiday bookings network

Ltd has replaced its IBM 3704 front end processor and 3270based teleprocessing network with a 3280 system from 1TT Business

The 3280 network consists of 12 controllers and 165 VDUs at locations including London, Manchester, Newcastie and Glasgow.

They are linked to two IBM 4341 mainframes located at OSL headquarters in Broxbourne, Herts. The 434 is are front ended by an ITT 3805 programmable communications controller which has replaced the 3704.

There are plans to enhance the functions of the 3805 with ITT's Multiple Access Facility software which enables VDUs in the network to switch between applica-

tions.

MAR is part of ITT's Commuoications Network Architecture,
which is offered by the company as
an alternative to IBM's Systems

The main application at present is online access to information on availability of OSL holiday villas and apartments and the airline seats sold by OSL and subsidiary company Wings.



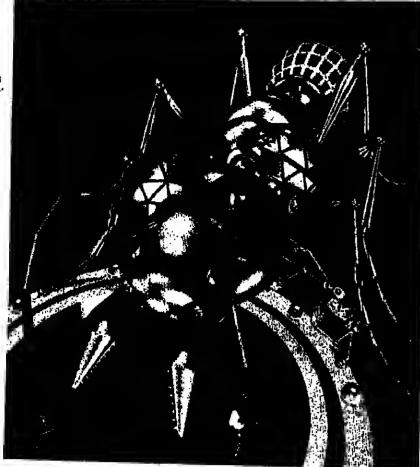
Works," en

elence-fiction

with the aid of

im produce

animated



Bridging gap between science and ar

THE excitement caused in the film industry by developments in digital animation and to ter-controlled effects is leading workers in the field to foresee the day when the local between real film images and artificial ones is completely crased. So heard the sudience is between real film images and artificial ones is completely crased. So heard the address computeryision '81 computer graphics eonference in London, where some spectacular he strations were mounted by such organisations as Lucas-films, makers of Star Wan, at New York Institute of Technology.

Very high resolution graphics and elaborate software is already enabling NY1T staff to produce animated figures on a video screen that incorporate fine surface textures, realistic specular reflections, and shadows at that the let hope that incorporate fine surface textures, realistic specular reflections, and shadows at that the let hope to low the let hope to low to low the let hope to low that the let hope to low the let hope to

textures, realistic specular reflec-tions, and shadows so that the images are almost indistinguishable from models. This combined with the flexibility of animation is opening up enormous new possibi-lities in film production, and

Lance Williams of the Institute staff is already planning a science fiction film to be called "The Works," featuring weird mechani-

Lasers

In straight photographie filming, computers are being ex-plored as a means of processing

images after they are shot, and helping to combine separate shots.

Alvy Ray Smith, from the rapidly expanding computer development division of Lueasfilms, described the research being done to find an effectivo means of digitiaing film and then printing it out again after manipulation. This will probably be done with

The aim is to produce resolu-tion-independent software so that future technical refinement of op-tical equipment will nut be held back. He saw no chance of video replacing film as the basic medium used, because of the inferior qual-ity even of 1500-line televisinn pic-tures.

Computers are already being used to control the movement of models, for instance of spacecraft, and to manage the logisties of film production, Smith said.

ment of Logica, "We are on up a new threshold of merception, and at the same bridging the gap between some and artistic cultures." image synthesis, digital audio, shd computerised editing are all being worked on. .The capacity crowd at Compu-

NEB makes 552% on deal

colour, textures, geometropersions on images, and the

The result is a set of em-narily vivid abstract pictus, cluding hints of natural in

such as valleys and lastes People have told Miller that remind them of things the seen in their dreams. He sale:

the images could not possible in reality, and he would real thought them up without ke

Hamburg, and Michael John Hamburg, and Michael John San Francisco Communication raised the point that, far fast ing o toy as it was largely real now, computer graphics and coming an essential committee that the forestable to the standard that the forestable in the large and the standard that the forestable in the large and the large and

tions tool as the information

became too grest to minimize linearly in words. The information

economy demanded the witiese techniques, they said.

The advertising industry the leading edge of using the nology. Computer visualism TV commercials before the

finally filmed is becoming a portant technique, and met images are already being are rated into commercials in the

The conference was shot commercial for a Canon can that even managed to line's.
VDU image with a film inst

the actual object, a trick 45

base of patterns.

• From front page

Having repaid its £325,000 to the NBB, SDIL will not to the private sector for loads. cribed by an SDIL spokesman as being "very quiet at the moment". Fewer than 10 people were assigned to the New York based company and they were carrying out only a small amount of consultancy in the real time industrial control field. But there were plans to develop software products for off its SPL holding fairly is appears to be making no more the moment to get rid all minority holdings in the moment to get rid all minority holdings in the moment to get rid all minority holdings in the minority holdings in the minority holdings in the minority holdings in the major within that company.

A apokesman for lyon and appears in Edinburgh said that the life of the major within that company.

A apokesman for lyon and appears the NER from his company. to develop software products for

sale by SyaDes.

The SDIL spokesman pointed out that his company retained links with the NBB through its more with Arenon in the viewdate. work with Aregon in the viewdata

held by the company's directors, chairman Philip Swinstead retaining his 51% controlling interest:

When the NEB sale was announced Swinstead described it as "an essential preview to a public quotation in the next few years". other 74% of SDIL is still.

the NEB from his company, the NEB from his company, the stressed that IIC and the new shareholders would be part in the management of III. The latter employs 320 people is the holding company. Systems Designers Ltd 197 and biggest member company.

Itel totters into bankruptcy • From front page

lion is still in dispute, though Lloyd's is understood to have settled about \$200 million of claims so Is. They have all bebut met by a continuous fund set up in the US during World War II.

Now that Itel has gone banking the \$80 million found made as consortium of French and with hadin will stoodbly be written off, along wines \$90 million found.

A number of Itel's US can are accepted changed appearance of the basic restricted leade payment customer in return for of the machine over the of the lease. This is treen 5 2 years.

At least one customer was fair to promise a secsular to the promises because in the promises because in them it in.

WITH the announcement that the terface, 21 parallel I/O lines, eight first peripheral chip for the 68000 operating modes and 128 bytes of 16-bit microprocessor is how available. Motorola has kept to its 5/16-bit processor on board, 2k planned schedule for the release of bytes of ROM and a 16-bit counths 68000 family over the next two. ter.

Colour computer from

Tandy poses threat to the Commodore VIC

ter, which was announced at the same time as the Model Three and the pocket computer (CW, August 14, 1980) is to be released in the UK in August.

At a veril released by the column screen VDU will cost an extended to the UK in August. At a retail price of about \$399 in extra \$399.
The US. Tandy's colour computer

The VIC 20 will also sell without

MICRO NEWS

the US, Tandy's colour computer ould pose a threat to the oewly nnounced VIC colour computer rom Commodore.

The VIC 20 is to be released at will be available by the end of the eould pose a threat to the oewly announced VIC colour computer

liaster (CW, November 27, 1980) and is expected to sell in the UK for under £200.

will be available by year, according to Commodore.

With 5K nf RAM expandable to 32K the VIC system, which is 32K the VIC system, which is Japanese designed, will also be aimed at home and educational use. It will run ROM cartridges

The six-month delay between the US and UK launch, according to Tandy, was to allow for the conversion to British standard colour television, PAL. The company is hoping to fit a Prestel adaptor interface to the system.

Is. It will run ROM cartridges and law a cussette facility. Like the Pet systems, the VIC 20 is based on the 6502 8-bit microprocessor from Commodore's subsidiary, MOS Technology. It also uses a special video ioterface chip called a VIC which

The TRS 80 colour computer

uses Motorola's 6809 8-bit proces-sor with 16-bit internal architec-

TRS80 will run either colour Basic or extended colour Basic, while the VIC 20 runs Pat Basic, probably stored in 12K of ROM.

Software

Pet software will need to be especially adapted for the ViC, but the user will have an extra facility

Both systems have a single RS232 serial port for eassette and other peripherals. Commodore has planned a single floppy disc drive and a printer, while Tandy just specifies a disc facility and a prin-Mike Rees, winner of the Bast Business idea Award.



alerting the operator to any faul oo the line, as well as pass the data Motorola plant

MOTOROLA plans to invest \$22 million in a semiconductor manu facturing and testing plant in Srl Lanka. It will employ 2,000 people and start production in 1982.

Book for ZX80 users — but no ROM

MAKING the Most of Your Chip was still in the EPROM ZX80 is the title of a new book for first-time ZX80 users written He wanted to loclude a drive

Prestel

for first-time ZX80 users writtan by Tim Hartnell, co-ordinator of the National ZX80 Users Club. Clive Sinclair, originator of the ZX80 personal computer, has aiready ordered 1,000 copies which will be aold through Sinclair Research in Cambridge.

Selliog for £5.95, the book describes programming the ZX80 from first principles and contains over 60 complete programs, an active display routine and a breakdown of tha features of the new ROM, for which users have been waiting a loog time.

He wanted to loclude a drive for the printer peripheral, which is planned for release in the middle of this year. This would avoid having to develop yet another versino of the Basic ROM.

Sinclair at the time denied rumours that software bugs were the eause and said the chip would be ready early-this year. His only comment oow is that "It will be available abortly".

The 16K RAM package designed to exteed the standard IK and recipied to extend the standard IK byte.

been waiting a loog time.

After a decisive and well published launch at the end of isstsummer (CW, Septamber 11, 1980), the 8K Basic ROM chip, was mystariously whipped off the market six weaks later (CW, October 16, 1980)

The reason given by Clive Sinciair was that extra functions were to be incorporated while the

of RAM and replace the 3K byte expansion boards was announced at the same time as the ROM and has been available for six weeks.

The 8K Basic ROM ehlp was designed to enhance the ZX80 by replacing the 4K ROM original. There is no upward compatibillty, as the two chips contain alightly different Basic.

MOS growth rate levelling off — European report

THE Europe so Metal Oxide pany also considers that micropro-Semiconduotor (MOS) market will cessor sales should be around \$500 fisve grown at a rate of 21% per million and logic sales around \$500 fisve year over a five year period up to 1985, according to a study by Eurotechnique. Previous growth was memories and microprocessors, reported to be 33.7% from 1978-79 but in both cases growth is exampled to be 33.7% from 1978-79 but in both cases growth is exampled to be 33.7% from 1978-79 but the 1984-85 figure is period; are expected to increase expected to be between 22 and

over 100% from \$750 million over 100% Microprocessor growth is expected to decrease from 50% in 1978-79 to 25-30% per year by 1085 for 1981, Burotechnique Cessors one-lifth and circuits for predicts a \$530 million market for cessors one lifth and circuits for consumer products such as memories and a \$215 million mar-

By 1985, MOS memory sales for 1980-81 is expected to be will reach the \$760 million level; 22.2% for memories and 43.3% according to the report. The com- for micros.

Motoroja sticks to 68000 plans

years. Next on the schedule for release. The 68120 intelligent of thereil are the 68122 terminal node controller and he 68124 error deconvoller is programmable by the controller and he 68129 error deconvoller and he 6

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Argus 700 Senes 2 is based on new versions of the Argus 700F and G central processors which can be used individually or in closely coupled groups supported

by a multiprocessor operating system.

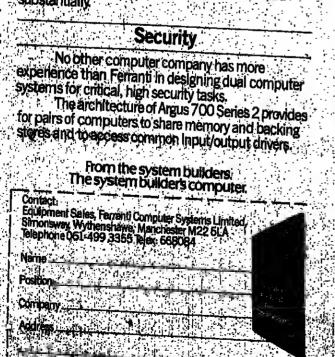
In its various configurations it's a package designed to meet the needs of almost all control, communications and information handling applications. A cost effective system, competitively priced.

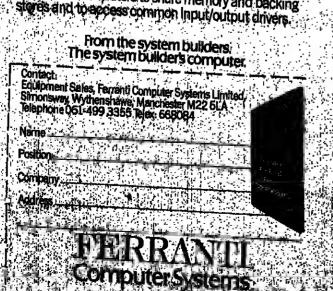
At the top end of the range Argus 700 Series 2 offers processing speeds of up to two million. Instructions per second

Argus 700F and a cache memory for each Result, reduced load on the memory bus, speeding processing by as much as 60%.

THE BUS STRUCTURE

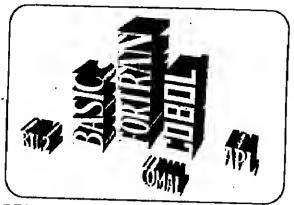
Intelligent channels with fixed programmes handle routine operations. They have access to the memory bus and operate in parallel with central processors, reducing the central processors' load substantially Security No other computer company has more expenence than Ferranti in designing dual computer systems for critical, high security tasks. The architecture of Argus 700 Series 2 provides for pairs of computers to share memory and backing stores and to access common input/output drivers. From the system builders. The system builders computer. Contact:
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Telephone Q61-499 3355 Teles; 668084





by Claire Gooding

SOFTWARE FILE



Comal 'will soon be widely used in education'

MINORITY LANGUAGES

"Something is rotten in the state of Denmark." - Marcellut. '(), reform it altagether." -

IN the carly 1970s Burge Christenson of the State Teachers'
College, Tonder, Dennisrk, had
made a start in computer education. He had an RC minlcomputer and used Basic to introduce programming to his studenta.

Like many other teachers he sp-preciated its abort vocabulary, simple syntax and easy operating environment. But all was not well, and he illustrates the bad side of Basic with the atory of "Jolin'a

John had come back to one of The progrem bad a bug which John asked his tutor to find. After some patient re-analysis the bug was found along with twn program statements which were entirely redundant. The flaw of dissemination for new software, and one has to ask why and how is in the program wes such that in no circumstances could they ever be executed.

The trouble was caused mainly by injudicious use of GOTO statemade worse by the lack of meaningful variable names.

meaningful variable names.

Subsequent investigation and discussion led Christelisen to the conclusion that Basic lacked some essential structures. The definiencies made the use of COTOs cies made the use of GOTOs to a host Basic. necessary, and the easy operating environment did oot encourage the rigour and discipline which might

Pecling that Basic had too many

A NEW generation of languages has grown up to serva the various fields in which computers have found a role. Software File la aampling a few of these "minority janguages" and handing over to apecialists to explain how they can

other machines, and in March of that year a definitive Comal atandard was published by a commit-tee based in Deumark but with

Towards the end of 1980 several systems had Comai: the original C mint, ICL 2900, Data General Nnya, Comet ood Piccolo Research Machines had also exhis own programs efter a few months in order to use it again.

The program bad a bug which lobe acted his most a few pressed strong interest. By this time it had replaced Basic in the Daniah "Folkachools" (7-16 years), in the "Gymnasia" (16-19 Thia was a remarkably fast rate and one has to ask why and how it

happened. Pirstly, Comal draws strength from two great traditions: the practicality of the Fortran/Basic line and the educational (and meets, and the lack of clarity was 'practical' appropriateness of the made worse by the lack of Algol/Pascal development,

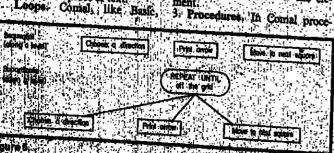
> Thirdly, teachers were offered the new software free and invited to try the extra features in their own time. Basic is a subset of Comal and the new features can be

three ways: they can follow one after another, they can be nested, or procedures can be defined and

of GOTO is relegated to rare oc-essions and order replaces confu-

Structural elements

below. Actual keywords of Comaioriow. Actual Reywords of Commission are used and correct indenting is observed but for simplicity, and to highlight the structures, the items within the atructures are sometimes stated loosely io ordi-



be of particular value to both programmer and end user.

Thie week Roy Atherton, of Bulmerahe College of Higher Education, diacuasea the language Comai, which he sees as "a cure for Baaic". He believaa that it will agon

be widely used in education, and that it may well win acceptance for buainese applicatione, although it atarted as a micro languaga geared towards teaching students the philosophy and practice of progrem-

dures are named. A procedure

PRINT "<": ACTOSS = ACTOSS-1 ENDPROC

This would be called by EXEC gowest

There is no chance of occidentally entering a procedure as there is of entering a Basic aubroutine, and the naming ensures rea-dability. EXEC gowest is more readable and safer thao GOSUB

In summary, the atructures and concepts embodied in FOR, RE-PEAT, WHILB, IF, CASE, PROC are necessary for the natural analysis of problems, the development of clear, safe olgo-rithms and the writing of wellstructured programs.

Further, there are only three possible relationahlpa between these six elementa: sequential, subordinate and procedure calls. Objectives for the teaching of programming are clarified.

allows loops with exit oo a specified count. The draw the top line of the grid one could write: Two features of Cornal turn out to be more important than they might seem. System-aoforced indeoting, which means that the appearance of a program must reflect its atructure, also provides a valuable debugging aid. If the indentity does not "come home" properly where it should an error is indicated — usually a structure has not have closed.

has not been closed. Secondly, the fact that all structures are opened, divided or closed by a single keyword in each case makes it easy to state simple rules for writing o program from its atructure diagram or tree. A "oatural walk" around the tree

Start "walking" at the at and proceed as though; "branches" were walls, it ceeping them to your left. When a node is encounted:

the way down, opers 3. When a node is encounted the way along a level, we de

ing keyword if appropri (ELSE or WHEN). 4. When e node is encountered the way up the tree, the

When o "Leaf" is encounter write down the necessary of The conventional symbols is

shown in Figure 4.
Relationships between der can be shown, as in Figure 1 The level in the structure grain corresponds to the ladi

indenting in the code. A properly drawo structure gram is an honest reflection both the analysis and the prop There is a unity between any diagram and program, Giror of the three, the other two of produced easily.
This symbolises the imput

fact that the style of a proprinting language influences the of its users. Computers propri people and a good language.

Comal will enhance analyzed well as programming skills. is. walk" rules on the Footbal

gram in Figure 6.
If one does not have access dents becoming "hooked into" Unix at an early age and taking that experience into commercial Comal, if one has to write in la is it not rather pointless to ... Just ea advocates of he

using the system provide a argue that a person working example for potential commercial users of Unix. may bave to program in Pare abould learn Pascal first, so iti But what of the commercial market? Wilson said that around school. If you have to use best is still a good idea to team the and think in Comal; so that sechniques of problem analysis. 35% of Uoix systems were lo commercial environments, but in the UK it is only during recent months that the commercial applications of the operating system have been

Tha main reason for this is that

Those wishing to have their
modified versions such as Onix
are oow evallable for 16-bit
microprocessors, and two or three
micro systems using Unix are oow
available on the UK market.

10-bit systems are concerned.

Those wishing to have their
products included in the survey
about submit the details to
UNIX Software List, Infopro
Systems, 56 Cliffaide Trail, Denville, NJ 67834, USA.

UK interest in

Unix grows, despite terms

Add to that no patent indemnifi-cation and the fact that the product Unix, including designated CPU

comes "as is", and it is surprising licences, data centre, corporate,

that Unix has a commercial life at all. Eveo so, there are oow an estimated 2,000 Unix aites and comorcial interest in the operating of sub-licensing through selected OBMs for Version 7 of Unix, its

system is rapidly gaining momen-tum in the UK.

Unix was initially developed by

Several forms of licence are

Not cheap

that for a suh-licensing agreement

is not cheap, however, and Wilson

seminar on how these costs were worked out. There is also the

danger that even if you have paid

for your licence, other people could obtain their robles of Unix

without paying the premium.

But as Wilson commented

"Each agreement has very specific

language about the production of software. This is not covered by

patent laws, so each licence has an

Bell may even refuse to grant

licence in a certain country if such

an agreement cannot be upheld. In the software business, the protec-tion of assets is sometimes difficult

to achieve. For a company such as

Product

IN an attempt to discover buy

othorwise — is available for the Unix operating system, US firm. Infopro is compiling a list of Unix and C (the Unix programming Isoguage) products for future publicating.

Infopro feels that while Digital Rasoarch's M/M is likely to

remain the atandard nperating system for small 16-bit systems oo grounds of cost, Uoix is all set to make a killing where the larger

16-bit systems are concerned

agreement to protect the Bell

system trade secret."

In the past Unix has gained wide Bell Labs, with a product gaining

acceptance and popularity in edu-cational eatablishments the world, a fool-proof method of

throughout the world, as a licence stopping counterfeit productions is purely for the cost of producing

The cost of a single licence and

NO maintenance, no warranties.

openly declared at the Unix gath-

Bell Laboratories, part of the US multinational AT&T. Owing to

the fact that the parent company is

a regulated monopoly in the States, Bell does not develop any

producta which are specifically de-

As Otis Wilson, maneger

patent/licensing for Western

manu facturing and supplying systems within the AT&T group,

electric, which is responsible for

"We are io the communications

business and these things we de-

velop, if they become commer-cially feasible, we sell 'as is'."
Wilson did go on to say,

however, that there was the pos-

company might become "more responsible in some of these

Hooked

After the seminar, Wilson said

that this policy towards educational establishments was unlikely to

change. The reasons are clear:

firstly, because it results in stu-

enviroomeots. Secondly, because

universities and colleges which are

sibility of change, and that the

signed for external markets.

commented at Nottingham:

Add to that no patent indemnifi-

ering in Nottingham.

First European event

THE Europeao Uolx Users' involved in the original shaping of oo April 13, 1981 et the Mathe-been invited to speak on its history matics Centre in Amsterdam, its and development, and also on curfirst fully European eventaince the
group expanded from the UK last

Although the Amsterdam meetyear, ing is simed at getting to know Chairman Alan Mason hopes Unix users in Europe (still mainly that the meeting will attract in the academic community), Ma-

that the meeting will attract in the academio con Buropean Unix users not already known to the Users' Group and would-be commercial users.

Morense: the present European "The next meeting, in late summer membership of 20 to a more represent, will broaden the membership sembels."

son has no intention of excluding Dennis Ritchia, who was commercial systems," he said.

MIT systems on market

THE Massachusetts Institute of built by MIT fiself, will make the company, neces of annucial intelligence research; has licensed e languago; commercially available California based company; LMI on hardware from Control Data Corp. to manufacture hardware Corp and Texas Instrumants. The said software systems for Air basic system is enoted as costing. These machines, proviously about \$80,000

schnology, meces of artificial in Lisp programming and running elligence research; has licensed e languago commercially available alifornia based company; LMI on hardware from Control Data



ONCE egain, much of Software File is given over to Unix, the NO maintenance, no warranties, no trial period and payment in advance. The conditions for licensing the Unix operating system were the Unix operating system were operating system which seems to be drawing crowds wherever it appearo in its various

> Unix has spread from its original mini environment to micras and mainframes, and it la now beginning to filter from the education world into commercial environments. A seminar held et Notting-

ham by Keen Computers to introduce Unix and ite "little brother", Onyx, drew en eudlence from both sides of the fence. Keen is looking to develop the commercial applicetions merket opened up by Onyx, which is distributed by Keen in Europe, and has al-roady won a following in the US. Jim Horsley reports on Onyx, end Bell's controversiel licansing policy for Unix.



UK companies to jump nn the Unix bandwagon. This was the advice from Cali-

fornian-based consultant Paul Miller, who outlined the potential of the operating system to 16-hit micros, during the Nottingham seminar last week. The seminar was organised by

Keen Computers, European distri-butor of the Onyx micro ayatem which uses Unix, and a member of tho UK Unix user group. But at a time when the number of micro systems on the UK market is expanding week by week, what chance has Ooyx?

Miller's auswer is simple: Where it can be used, it is frighteningly cost-effective. With Unix it gives the same computing power nn a micro system ns on a DEC i 1/44 for about one third of the price." It is in areas of productivity that

the Unix operating aystem has re-ceived wide praise, but Miller added that it was often necessary

10 be a mare experienced user of 10P, before the full beoefits of the system can provide a flexible approach to distributed processing.

The Onyx system available from Keen is designed specifically firm business applications, however, and as such is available with a range of packages for ennimunications, database management, word processing and business applica-

Flexible approach

The Onyx system marketed by Keen is available either os an 8-hit system for nne or two users, or as a 16-bit configuration, which can handle up to eight users. This larger system, the C8002, incurporates a fixed disc drive, cartridge tape drive and up to 512K-bytes of memory in a single enclosure.

Almost any standard terminal, printer or modern can be directly

According to Miller, there are number of other developments in the pipeline from Onyx including 100 megabyte discs by the end of the year and a range of program-miog languages including Fortran, Basic, Pascal and Cobol.

It is the quality of the operating system which may provide the key to the success of Onyx. There are already several other similar systems available on the UK mar-ket including Omnix, Uniflex and Cramitx, as well as microproces-sor systems supplied by Microsoft and South-West Technical Products which use Unix-type operat-

The speakers at the Nottingham seminar, who included two university lecturers and two representatives of Western Electric who are responsible for marketing Unix, ieft little doubt as to which system they felt would succeed.

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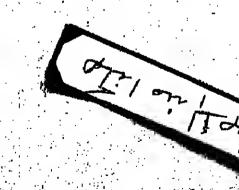
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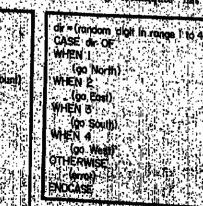
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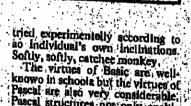
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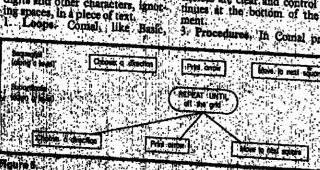
IF (letter) THEN IF (vowel) THEN (increase vowel count) CASE OF OF WHEN I (oo North) WHEN 2 _ (go East) (Increase digit count)

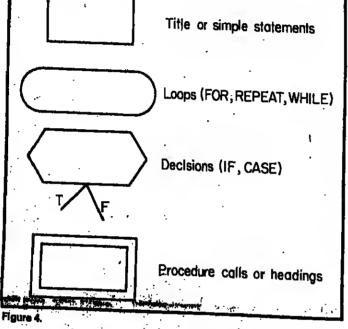
(increase other count





virtues to shandon, he decided to extend it. He took the control structures of Pascal and translated them into Basio's simple notational style, added long identifiers and a few other useful features, and with some help from very able surfaces. some help from very able students, modified the RC Basic software. He tested the result and called it COMAL (COMMON Algorithmuc) Pascal structures nor only enable the writing of well-structured resdeble programs — they are exactly the concepts which are essential to the analysis of problems and the development lot, algorithms or Christensen's first article in 1975. By 1980 the software had been tested, refined and spread to programming techniques has





FOR across = 1 TO 20

But unlike Basic, Comal also

llows exit from a loop in two ways

(choose a direction)

(move to oext square)
UNTIL (he is off the grid)

WHILE (he is on the grid)

(choose a direction)
(move to cent square)
ENDWHILE

PRINT "-"; NEXT across

REPEAT

beneficial influence on the way people think about problems, Essentially there are only six REPEAT/UNTIL, WHILE-CASES and procedures (Comal notation). These six simple structures can be related in only

Thus o set of principles is estab-lished as the basis of problem analysis and programming; the use

Why not use Pascal? one might ask. It is the combination of simplicity and power which makes Comal attractive to educationists.

The six structures are illustrated implementation, help to preserve understanding in a situation (oested IF statements) regarded by many as one of the least compreed in brackets, bensible types of program segment e Illustrated by (see Pigure 2).

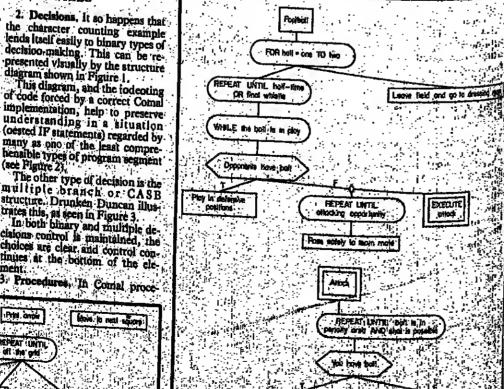
All elements will be illustrated by parts of two programs:

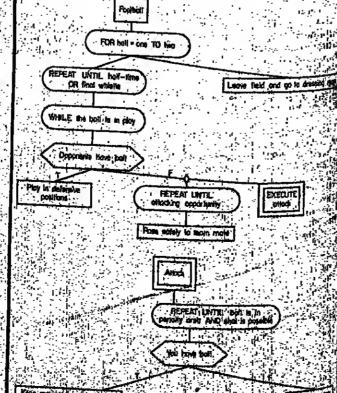
The other type of decision is the multiple branch or CASB structure. Drunken Duncan illustrated by north, South, Rist or West.

All elements will be illustrated by parts of two programs:

The other type of decision is the multiple or anch or CASB structure. Drunken Duncan illustrates this, as seen in Figure 3.

In both binary and multiple decisions control is maintained, the ciaions control is maintained, the choices are clear and control continues at the bottom of the element.





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doing fairly well, according to a recent survey released in mid-January. National Analysis of Salaries and Wages is published by Reward Regional Surveys of Stone, Staffs.
The £4,031 is a median figure

arrived at an a result of inquiries to 132 companies. The people whn conducted the survey, which is based on all jobs in 293 private sector companies, stress the dif-ference between a median and an

By ranking salaries from the highest to the lowest, the median salary is the one which stands at

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year can consider themselves as sensible to quote median rather than sverage figures because the latter tend to be distorted by freak high and low figures. Similarly, it means more

quote the quartiles and deciles of Table 1. Alicionados of jargon will be pleased to learn that 50% of the entries fall between the upper and lower quartile and the range be-tween upper and lower deciles is

Computer Users' Year Book for 1980 has operations as a slightly more remunerative job. Its 1980 median salary figure for nps is £4,111 which is, incidentally, an of making predictions although

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ducad by courtasy of Raward Ragional Survaya Ltd.

nual salary of £3,477.

A senior operator, according to CUYB, could have compared his pay cheques with a median figure of £5,531 in 1980. In the six months since spring

1980, the Reward Regional survey found operators' salaries to have increased by 10% while senior operators fared slightly better with a 13% median increase. That amounts to £398 and £650 respec-

oone relates specifically to DP. It says: "Recent low pay awards are still insufficient to make nuch

impact on pay statistics. Rises over the six months show an annual rate of 17% and over the year the change has been 19%.

"So, pay rises are sinwing down but not, as yet, dramatically." For 1981, increases of between 121/2% and 141/2% are predicted.

Taking the median predicted in-crease figure of 13½% — and plac-ing a degree of trust in the findings of the survey - an operator would

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he makes a number of draconian He thinks that security should be tightened with an alarm connected tu the guard's office once the computer room is left vacant for the night. Ops though

by Paul Fig

How to make op sh

industrial wrong'

safe against the

the opportunity to be dishonest on

a large scale. Hut most cuses of

pany secrets Act.

"Every time as on notice," continue by be excepted from his While an op is million company. aperator crime never come to light because it is not in a company's interest to publicise how it has Moiling lists, payroll and profit details and budget plans can oil be of value. The op, who is often not company, he or shall ollowed to take t being puter room. carning a great deal, has easy occess to the grands and is a printe

"I know it seem it Fry, "but it is now; batch of hard copy mp target for temptation. That's the apitton of Molcoln Fry. Fry says of his 15-year coreer in He recommends for should be destroyed to and drivers should be operations: "There isn't a job !

haven't donc." Now he is planning to publish a book no operations espionoge.

The op is someone low down blity of the opt many also bave the opportunity Perhaps the month n formation denied to those with a gestion is that the the far higher status," Fry exploins. In mortgage should be me order to minimise uperator crime, removing the excuent

itig to temptation. I'ry reckons that sale for from confirming it of ons, would scrude as marking recognize

You, too, can a sailing vesse

gree of uncertainty about my human identity. I had just subjected myself to the Murrisby Differential Tost Battery, part of which sought to make a comparisoo between my personality and a

Three and a half hours were spent floishing acqueoces, doing montal arithmetic and the like and some days later I was given measurements of "concept apced, perseveration, personal confidence and intellectual confi-

Those qualities, in that order, were equated with a sail, a keel and two outboard motors.

It turned out that I was a fairly well-balaced kind of boat with a huge personal confidence-cumoniboard motor that forced are to

Should you have an idle mo-ment on the night shift, you could

anulyst.

Have your subject! salling dinghy plus set though this wasan part! I did, gaze sage set! chunter on about greater ability to loss and pencil lest a to me.

ken circle and a consti The square is ment sant ideas of hose, in it the future, the broked of sex and the ful confuture, the broked of sex and the full confuture, in its full conf

In a similar rela, at says that people's history one of three categoric but or blird. I'm a many with a borse's face to home is a dice and talk

Consumers' crusade

GRAHAM LUND is a busy man, Apart from lecturing on operations and being ope manager for the Royal London Mutual in Colchester (Op Spor, January 8), he is multinational. A multinational of the IBM CUA operations group.

Traditional collines are supported by the collines of the IBM CUA operations group.

Lund is standing down from the done it for three years; however, he plans to become a CUA council member

nemoer.

He says of the CUA: "We have no link with IBM and are completely autonomous. We're not a pressure group and don't wish to be seen as such. Our prime object."

Protocol makes its debil

PROTOCOL Operations first times to talk more even! Editorian and Training in All that he complete Complete Operations, will be fee. Inflored's folding company has to offer, the first 50 found Protocol man with be at the Coloury Hotel in Baylywater London, on Pebruary ! the same leavest the crease will be charred by Graham Land says of the same leavest than the crease will be charred by Graham Land says the same leavest the same leaves the same

COMPANY NEWS

CAP Gemini Sogeti takes over Norwegian consultancy

THE giant French-based computer services group, CAP Geroini Sogeti, has extended its eropire with the acquisition of the Norwegian software consultancy Data Logic. The latter firm was owoed by Data Logic of the UK until 1972 wheo it was bought by its

Norwegian employees.

According to CGS, Data Logic is the largest Norwegian company in the field of

professional computing services, escluding service bureaux. It employs 56 professional staff and chalked up a turnover of well over \$2 million in 1980, although this is trivial compared with the turnover of its new parent company.

CGS espects to report approaching 1'F600

being bought by the giant Gan-oral Electric Co of the US for \$100 million.

The deof has been welcomed

Calma esecutives because GE

is a far bigger user of Cad/Cam

aystoms than its existing parent. United Telecommunications of

There are two unusual aspect

to the deal. One is that GE will

pay Uolted Telecom so addl-tional amount in 1985 depending

on the performance of Calma in the years 1981 to 1984. It could be as much as \$70 million.

The other la that under the US

anti-trust laws GB may have to

CONSOLIDATED Computer

loc, a company owned by the Canadian government and Fujitsu

of Japan and with 10% of ita shares

publicly traded, has reported losses of £9 million on sales of \$9.7

Dollar lost on every sale

Kanasa City, Missouri.

Data Logic's existing customers include banks, shipping companies, the Norwegian and the computer industry, cluding Norway's biggest dnmestically

ready includes companies in Sweden, West Germany, the Netherlands, Belgium and Switzerland. In the UK CGS jointly owns IAL Germini with International Aeradio. Data Logic in view of the boost to Norway's

Last autumn CISI, the computer services subsidiary of the French Atomic Energy Commission, sold its 34% share in CGS to a

currently holds in another leading Cad/Cam firm, Applican. GE's 22.7% holding to Applican is as-

signed to its vooture capital divi-

sion, Business Development Services Inc., while the 100%

being taken in Calma will lead to

plans to set up a permaceot HQ nearer London Airport.

million for the first nine months of the year. Consolidated, which

manufacturers Key edit equip-ment aupplied to ICL and Fujitsu,

lost over \$10 million on sales a

\$22:7 million last year.

on the slide downward slide and sank a further group of Freech financial organisations. 10p to 48p last week. Stockbrok

ers Heseltine Muss predicted the shares would hold temporarily sround 50p, and then fall to 30p. Reports from the company suggest some improvement in over-seas orders but this will probably still be at a high price in terms of

ICL shares

outability. The breakdown of the talks in Geneva on Namibian independence has brought nearer an international trade embargo on South Africa, and simultaneously a threat to ICL's best market in Africa.

Investment trust nets £97.000

it hecoming part of GE's indust-rial Electronics Business Group. Calma points nut that it will remain completely autonomous after the GE takcover. At the EDINBURGH-based Independent Investment trust, one of the biggest UK holders of shares in US same time it expects to got all or most of GE's annual expenditure high technology companies, and a major beneficiary from the Apple share launch had gross income of £330,000 for the six months end-ing December 1980. After interest, on Cad/Cam systems which is now running at about \$20 million. Based ot Sunnyvale, Califor-nia, Calma has established a tsmporary headquarters for Europe tax and other charges this worked ot Kingston-upon-Thames, Sur-rey, but is going shead with its out at £97,000 net.

Independent Investment trades on the unlisted securities market at a current price of 117p. The following companies appear among its holdings: Apple Computer (150,000); Centronics (25,000); Data I/O (34,884); Lanier Business Products (85,000) and Sensor-matic (80,000). The company holds 875,000 shares in United Scientific Holdings and 90,000 shares in Wilmark R&D, both UK

Growing pains hit General Electric buys US Cad/Cam manufacturer Scicon profits CALMA, one of the world's leading manufacturers of Computer Alds d Design/Computer Alded Maoufacturing systema, is

reported by each of the two domes- with profits dropping from tic Scicon companies for last year, but heavy outlays on staff and new equipment have depreased

Scicon Consultancy International saw turnover increase from £111/2 million in 1979 to over £14 million with, at best, no increase in profits on the £200,000 made last

Scicon Computer Services reports turnover up from £4.4 mil-**CW SHARES TABLE**

B US Stocks S

growth - although this was deliberate. Profitability will prob-ably have dipped, and certainly not have growo, over 1979." Scicon Consultancy has just paid

£902,000 to £200,000 respectively.

have had a very, very significant increase in staff - a net increase of

200 - during calendar year 1980.

So we have carried the cost of

Scicon Consultancy operations director Paul Pearson, said: "We

> it has a major sonar programme under way for the US Navy, was one of its attractions to Scicon.
>
> After a peak of £1 million profits on £3.7 million turnover in 1978, Scicoo Computer Services has seen profit outturn slip back in a market described by deputy managing director Jack O'Malley as "tough".

over \$10 million for Systems Control Inc of California, a move which will add 500 employees to the company's existing 700 and

bring in turnover for the year end-ing February 28 of around \$25 mil-

inn. The final turnover figure will

The consultancy company, like Scicon Computer Services wholly owned by British Petroleum, gains

45% of its revenue from work in

the defence field, with contracts lo

Saudi Arabia and the rest of the Middle East. SCI's complemen-

tary work within Nato and for the US Department of Defence, where

determine SCI's exact price.

New machinery

O'Maliey has just signed a £1.4 million cheque for a Univac 1100/62 to replace one of the bureau's pair of maximum configuration 1108s and will install an 1100/61 machine in place of the other early this year.

In addition it is upgrading its IBM 370/148 to a 4341 at a cost of £500,000 and took on new officers.

in London's Centre Point last year. The new machines are part of a three-year investment programme at the bureau's Milton Keynes

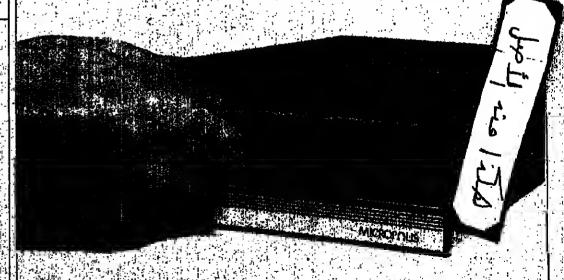
base, almed at strengthening its position in engineering and scien-tific, City and lostitutional, and special commercial applications.
The latter includes the provocatively-named Scicopath database on road junctions for the Ministry of Transport.
Up to 20% revenues for both

Scient Consultancy International and Scient Computer Services came from parent company, BP. The two companies accounts do not include the results of SCS; the Scient company in West Germany

Floppy disc drives and Winchesters from Micropolis

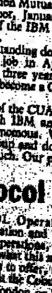
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Entity 7, persisted to 6

Selections Emply of that Entitly Type and

 \triangleright^{γ}

Robin Laney, anated at Portway Schnni's Cado 20 computer, and Michael Reas Iright) are two of the three 17-year-olds who have started a company, Software Six, supplying services to other Cado users. Profits return to the school — and headmester John Larking looks on approvingly.

Sixth form goes into business

T'S not only policemen that are getting younger—so are entrepreneurs. You don't even need to have left school these days before starting your

own business.

Sixth formers at the Portway School, Bristol, have set up a company, Software Six which will use the school's own Cado 20 system to take over some of the tho services now offered to other Cado users by UK distributors DRG Business Machines of Weston-super-Mare and London.

DRG's managing director, Mike Klimartin, described how he had loaned the school a Cado a year ago. "They have turned out some remarkably good programmers.
We have no hesitation in using them for some of our overspill

work."
Software Six cut its teeth on Such in-sebool activities as examisuch in-sebool activities as examination administration, timenation adultinistration, timetabling, and pupil records: A mark
of confidence is that its next task is
to tackle computer sing school ac-

to tackle computerising school accounts.

Executives of Software Six are three 17-year-olds: Michael Rees managing director, his deputy Robin Laney and financial director of 18M United Kingdom. Marriott. The of 18M United Kingdom. Marriott has also been appointed public affairs.

Between them, the three must trun the company as a properly constituted commercial organisation with sharcholders and company as a properly constituted commercial organisation with sharcholders and company as a properly constituted commercial organisation with sharcholders and company as a properly constituted commercial organisation with sharcholders and company as a properly constituted commercial organisation with sharcholders and company as a properly constituted commercial organisation with sharcholders and company as a properly constituted commercial organisation because the company as a properly constituted commercial organisation because the same since held several management positions both at the company's head office and the Bristol branch office.

One difference, though, is that

One difference, though, is the school so it won't be a get-rich-quick exercise for the gang of three, But if riches lie in experience.

The whole project is part of the Young Enterprise Scheme and a fasherly eye will be kept on progress by ISC Chemicals of Avonmouth, which sponsors the school under the scheme.

The whole project is part of the SEVHRAL senior management changes formerly products and computer who will work in the data products appointed products and computer agroup, and George Sallers, to manufacturing and computer would trade, and busicess development of the company's manufacturing and computer would trade, and busicess development of the company's manufacturing and computer would trade, and busicess development of the company's manufacturing and computer.

WHAT is the next number in this the "in-

WHAT Is the next number in this sequence, given that the "intervals" between each pair of adjacent figures (1, 3, 2, 2, 7, 59, 21) are not significant?

16.17.20.22.24.31.100.12%
See page 43 for solution.

Despite my vallant offeritation December 11 to rule put dual solutions, several research.

tions, several readers have come now, several readers have come up with alternative layouts. One of these is in fact of great theoretical intest, since the four "quarters" (\$ 12.57, 1.9.124, 4.8.9.1) and 7.3 (\$ 10) also total to the Magic Constant of 26. Here it is: Jiolies, Sneaments
JANUARY 27
Johns of IBM to talk on talk 73
Jistorian School Diversity, John Brater University, 45
John Brater

		10,23	1990 A. M. 1997
		9	
2	12	4	8
5	.7	3	
	36	O.	

'Micro'-techniques to serve the incurable

AS I walked down the long corn-dors of the Royal Hospital for In-curables at Putney, a door opened on my left and I looked ioto a huge room under a curving omate ceil-

hospital served as a private house of a well-to-do family living outside London. Now It bore the faint marks of an institution, and was filled with chairs.

The Royal boasts an abundance of chairs - mostly wheelchairs to house the disabled patients. But this hospital is a far from depres-

sing place to visit.

Most people seem happy, more so than outside the hospital; but some, the severely disable who cannot talk or write, life trapped in a wheelchair can be a lonely business.

. It is towards these patients that a new project undertaken by the hospital computer department is

Using micros, they bope to reach – and ultimately test – the inteflectual capacity of patients who hitherto have been unable to

Dr J. Wedgwood explained that severe physical handicap can mask a normal and active intelligence. "It is important to test the mental function of each patient, so that PEOPLE and EVENTS

Impact of pictory on new Jelecon switching BCS South Wales akills in the engineering industry flew branch. British felecom, Coryton, Group: Bowates 500 ments of the pictory of the pictor

Property of handle's militoprocessor developmes art project. BCS South Vorkahre branch. Bringliffe Oaks Hotel, Nother Edge Ross, Bharffeld, 7.38

[ANUAR 129-36

Meeting [BM CDA Programming Group Unicon Hotel, Bright). Details

Two other members of the pro-

ject team are psychologist Sarah Wilson and computer specialist Geoffrey Wylie. Sarah is concerned primarily with the tests and in adnistering them to patients.

"At the moment we are concentrating on IQ-type and memory tests. One we are using is a variation of Raven's Matrices, where images of six pictures are shown on the screen and the next in sequence must be chosen from an array," said Saran.
"All the tests are multiple eboice

so in most cases the patient just has' to indicate one number."

Special input

Dr Wedgwood Intervened: "One of our big problems is that many patients have such severe motor impairment they cannot depress a key with one finger.

"We have had to design special input devices, such as a sensitive pressure bar with extremely large key-pads, so that the whole hand r even tongue could be used. It is fitted with an anti-bounce mechanism to iron out tremors.

Others we are working on are using breath control - Inhalation and exhalation to move a cursor

Alan Taylor has been appointed selea manager at Sigma Electronics, He was previously a sales engineer with EMI and later loined Sigms as sales

- FREUARYS

EBRUARYS

EBRUARY 10
The Siletmonic Office BCS Mersey
the Drinch, Possity of Stantes Lee
the Theatre Saverpool University
Planged maintenance

sing of sounds, where it patient cuit needed next. More me we're working on a ting only vary the volume, to a marker. Light signals are another passibilhudget. But a graphic per be useful sa that we could ity in investigate." There are about 270 patients at nur own shapes. We're no work to do though, for at Putitey and 30 imire at a centre in

Brighton, All are adults and between a third and n half are so Geoffrey Wylie speed ; disabled as to fall intu the class responsible for the come described by Dr Wedgwood. pects of the project and had Ten per cent of all patients are both the hardware - ni linked to a specially large aid vision - and wind motor accident victims, while half are spaaties or suffer from diseases like multiple selerosis, Parkinson's

programs, mastly in But i "Our eventual aim is to make up a battery of our own tests that we constraints on program in can standardise against existing psychological ones. In that way, but we want them opening they would be suitable for our par-ticular needs, but assessable," keep me busy for a few men Sarah Wilson explained. Scoring may be a bit of a prob-

lem. Many tests are time-de-pendent - the Eysenek ones, for example - while most of our patients cannot be time-restricted. "I think we'll have to establish norms for our group of subjects, and then compare individual

patients against them."

the outside world. One advantage is that the "I'crhaps we may erah scores can be totted up quite intto teach the patients to pres partially by the computer; there's no danger of experimental hias from it." it would counteract the de boredom they face me

He said, "Luckily, the

Sarah explained ikk

What we would like mg

the hospital at various he

where any patient can the

mood takes him or be. h

inputs could link the hope

longer-term aims.

New post at Racal-Redac THE newly created position of deputy managing director at Racal-Redac has been filled by Bill Hillier, who list played a major role in developing the company's computer-aided design systems. The appointment cames at a time when the company is seen a systems. The appointment comes at a timo when the company is expanding into the markots of the US and knoppe. Hillier will be responsible for all activities on the Tewkesluny, Gloucestershire, site where development of CAD systems takes place. He will also co-ordinate research and development

Alan Soolor has been appointed managing director of AM Varityper. He joins the company from Harris Systems Ltd., where he held the position of general manager for the composition systems division. Deputy MD at Control Data John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

MANAGING director of Control Da-taset, Terry Cave has added to his responsibilities within the company. He bas been appointed deputy manag-ing director of Control Data, the com-puter manufacturing, marketing and services subsidiary of the US company Control Data Corp.

Cave Joined the company in 1970 and beld several sales and management positions until his appointment as mana-

Tom Winter, managing director of ICS Computing, has been elected chaltman of the Irish Computer Services Association. Pat Chambers of COPS is vice-chairman. positions until his appointment as man-aging director of Control Dataset. sping director of Control Delayer.

Several other senior management appointments amounced by the company metude Neil Spoonley, regional manager of technical services; Brian Manager of technical se

rointed technical manage, all rol-Redse printed circum all electronics division. In 1971 promoted to production death, became technical directs in 1971 ager for education series of Payne, regional manage is p atonal services, and David Pales ager of financial control and pane

US, France and Scandings.
Previously, he worked for its
struments where he was broken

carly stages of developing an automated test equipment like 1970 to Join Racal, when he

Victor Ochi har been upp sistant marketing manage a big Devices. He joins the company Elso Africa Inc where he was proadviser to the managing direct Mike Henry has joined Cent

manager, responsible for the Area and Scotland. He islands Geoff Squire has been group manager at CACI, He par ICL where he served as large

Livervare File THE CHANCELLORIS MINIZA CHARLET MI

PRE-BUDGET BATA.

MODEL OF THE SCORE

AND IT WAS LATE

HERE ACCIDENTALLY FED TO THE POLICE NATIONAL COMPUTER THIS WEEK



The technique DATA ANALYSIS Of access

with describing the techniques CACI employs to analyse and design systems, but very little has been said as yet on how the techniques fit together into the stages of a project.

Once all the techniques have been covered, the last articles will be devoted to describing the sequencing of tasks, but it is worth describing briefly the phases which will have been completed before access path analysis is attend, in order that the technique can be placed in context.

Access path analysis normally begins once the framework for the project has been completed, in the form of global entity model, func-tional hierarchies and data flow diagrams for the upper levels. In addition, o development strategy should have been agreed, selecting the oreas for detailed analysis and defining which areas and functions are to be computerised.

The access path analysis technique described in this and the next article is part of the detailed analysis phase of a project. It is a method of determining and documenting the functions' use of data. The purpose of access path

 To check the entity model to ensure that all necessary enuty types and relationship types are

To provide the database designer with all the basic information needed for database

 design.
 To bring the results of functional analysis together so that I) and assume that we are deaigning a computer robot system. It has been decided that the roif there are changes to the funcbot cannot be trusted with laying out the tea things, but can be taught to boil the water in the are needed to the model, and if there are changes to the model it is clear whether it affects the kettle, warm the teapot, put the teabag in the teapot and pour the boiling water in the teapot: He

To help the ayatems analyst de-

lay out

Teapot" functions, and then a second function: "Pour Boiling Water in Teapot." We may in fact cannot be trusted with pouring out The external event which will rarchy to cater for this change before doing this study, so that the three computerised sub-functions maka lea otive bu What important points about the functions thus emerge from this example Pirstly, the function has one input, i.e. all the information needed to complete the function is residuale to it at the time pour bolling retier in pot may warm teapot if cold

Section I — Part 14

of our series describing a

system design methodology

by Rosemary Rock-Evans

We will tell the robot all he

needs to atart his part of the make

tea function, i.e. whether or not

the teapot is warm. Once he has

performed the tasks involved in

The two functions we would

therefore analyse during access path analysis would have been the

part of the "Make Tea" function which included the "Boil Water,"

"Put Tea in Teapot" and "Warm

It is being performed. (For example, a set of exchanges be-

tween a terminal user and a

system in an online environ-ment would be included within this definition.)

Secondly, multiple outputs may

put, e.g. Nn Tesbags. The function must not therefore

are triggered by other events during its performance. When we reach the stage in de-

he "Boil Water in Kettle.

poiled is needed.

To provide all the hasic in-formation for the next phases in the project: entity life cycles,

transaction design, program de-

sign. Functional decompositiun pro-

vides the analyst with a function hierarchy of all the functions and

sub-functions which the business

At the detailed analysis stage,

the functions which are to be com-

puterised are known, and it is a subset of these functions which are

analysed during access path

analysis.
These are the functions which

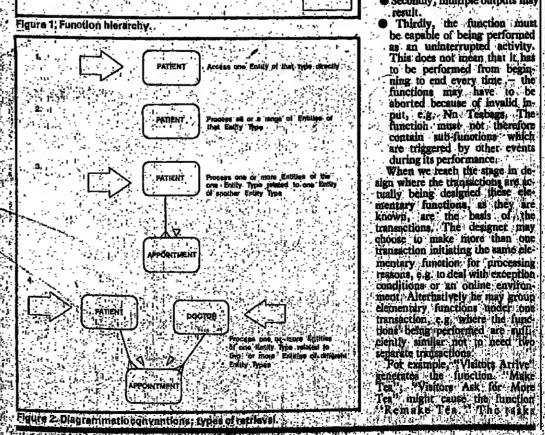
are triggered by events external to

the area to be supported by the

As an example we will use the 'Make Tea" function (see Figure

computer system.

Figure 1: Function hierarchy.



Access path analysis is docu-mented using functional models, next article).

conventions used to represent retrate each type of retrieval.

. Retrieve a patient's name, age,

"Warm Teapot," and "Put Teabag in Teapot" functions, however he cannot proceed any 50 and male. List all the outstanding appointments for a patient.
List all the appointments which
the patient has had with the the event of the kettle having

He has thus produced "outputs" - a warm, tea-filled teapot and a boiling kettle, but he can go no further until we tell him the kettle bas boiled. Then he can perform the "Pour Boiling Water functions are listed below to illustrate each type of update. into Teapot" function.

The entity model and descriptions of the elementary functions

event was being processed.
It should be noted, however, that a transaction is not an elemen-Figure 3. Disgrammetic conventione: types of updots. tary function.

which represent the entity types and relationship types involved in the elementary function with start the robot working is thus the "Make Tea" event, where it is asfunction form (described in the sumed that we can lay out the tea things while he is doing tho reat. In Figure 2 the diagrammatic

trieval are shown. Some example functions are listed below to illus-

sex and date of birth. Pind all patients who are over

doctor. In Figure 3 the diagrammatic conventions used to represent up-

I. Record the details of a new

Record details of the illness of a

Change the name of a patient.
Delete details of a patient.

are used, to draw the functional "Handle Patient's Death" is 1. From the function description, In this article the basic rules for determining elementary functions have been described and the dia-

the entity type(a) where the function begins, and specific entities selected, are detergrammatic conventions used to draw functional models have been The description of the function is then worked through to find In Part 15, some more complex

the other entity types and functions will be examined and do-relationship types involved, in cumented using the access path the order in which they are 3. A functional model is con-

The Data Analysis methodology In Figure 4 the functional model was developed as CACI by Ian for the very simple function: Palmer. In Figure 4 the functional model

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Figurn 4. Function: Handin Patlant's Death.

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FINANCING THE COMPUTER

Financing the computer is a problem which has nurtured a tangled jungle of knowledge as convoluted as the innards of any mainframe. In this special supplement one of our own reporters looks at an entrepreneurlal leasing com-

pany, Computer Financing; Parry Mitchell of United Leasing explains the role of his company as does Daphne Kandiah of Hamilton Rentals; and Allen Pawlyn advises on whether to rent, laase or

Cashing in on a booming market

KERPING a watchful eye on e simple ratio could have avoided the horrors of multi-million dollar losses on computer leasing currently being agonised over by the Lland's insurance market.

There the equally simple lesson being drawn by Peter Hunt, chairman and owner of Computer E.

man and owner of Computer Financing, from the debacle crused by the collapse of IBM 370 values after the Islanch of the 4300 range in early 1979.

The ratio is the comparison between monthly rental cost and purchase price. IBM typically set its rental charge so that 48 monthly payments, equalled outsicht, solo price, says Hunt.

When that ratio on the later (138/148) models had crept up to something like 15el by late 1977, there was clearly something going

Field day

IBM was encouraging the purchase of regions 1 which was to be superseded shortly. But US leasing companies continued to assume the same residual values (proportion of the cost not covered by lease payments) as before and had a short-term field day during which they were able to undercut IBM's rentals and maintained

as they say — was that Lloyd's of London and other insurers were left holding policies on equipment

another vital aspect of the compu-ter leasing business. Almost uni-quely, secondhand values of IBM computers depend not on the physical age of the machine but on

physical age of the machine but on the age of the range.

A 3033 bought today will have virtually the same resale value as the same machine bought when the range was first introduced,

Hunt also avoided leasing 3033 models as he reckoned the fact that they basically contained 370 architecture made 3033s vulnerable to the launth of a radically new IBM series. At the time of their launch,

series. At the time of their launch, the was searing up to the 4300 release and had ordered ground £4 million of machines as his first format into leasing.

Similarly, Hunt now sees the Herica 3081 as causing a substantial fall in 303X secondhand values. A 3031 bought new for between 3031 bought new for between £600-700,000, for example can now be had for around £200,000

Ergo, any leasing company working on a residual of more than that, of unable to re-lease and bring in income getting down to

that amount is in trouble before 3081 deliveries start to flow at the

Hunt, 42, is that well-known animal in the financial world — the entrepreneur. With a back-

A first venture on his own account in 1976, with Logan White in Megaleasing, came to an igno-minious end after rancour between

A year later, with finance from various property deals, he formed Computer Financias to trade in secondiano IBM equipment -

inancing began to supply end us-

ground as programmer, then salesman, with MCR his first involvement with leasing came at Standard Chartered Bank on postings to Amsterdam and Dusseldorf.

essentially buying on spec and then selling to leasing and renting

Late that year, with a £3 million turnover already under his belt, Hunt began to expand what was still essentially a one-man operation, buying the IDC listing for the UK and Burope. With this database giving details of all IBM sites, together with the kir configura-

tion, Hunt started the laborious task of working through the Computer Users' Year-book searching for prospects, with the object of

Controversy

Leasing has been generating much cootrovern of her some of he has ocen related to the collapse of Itel and the horrendous claims

Still more has stemmed from the

lessing company.

This has attractions for the DP. manager, whose main concern is to avoid restricting operation and meet the usually growing needs of

company which thought it could get out of a lease agreement with

ible leasing company.

An article in last November's Law Society Gazette, which cirrutes mong solicitors, warned lessees to ensure that minimum terms should be stated in the main body of the agreement, with the rate.

The article and that the lessee may be left in a difficult position, dependent on flexible leasing companies staying in business and nonouring obligations. If a company should cease to trade, the lessee will be left with a long-term obligation on the original machine, the solicitor author of the article added.



Seeing the lighter side of life in the leasing market are (left to right): Peter C. Hunt, chairment Computer Financing International Ltd; Mex Cowper-Smith, resident lewyer et Computer Financing International Ltd; end Stephen J. Messures, International seles director of Computer Financing

the lessor (the bank) because the flexible leasing company would pay the residual, found itself with a water-tight agreement with the lessor and a less-than-stable flex-

Hunt says his leasing opens will really take off when the liveries of his 12 model 30818

Hunt is anxious to distance Computer Financing from such operations and engaged Max

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What is IBM leasing?

FOR IBM computers, leasing works like this, A leasing company tecks out a user a lessee which needs an IBM machine. The lessee agrees to take one from the leasing comparts. leasing company and to pay a monthly rental charge.

This is Intended to cover the leasing company's payments to a bank for the money for the machine, plus so extra margin of interest. The lease pays, say, 10% interest.



spread" is the leasing company's has limited funds. It assigns the profit.

The leasing company has to go to the bank because it does not have enough money to pay IBM the lease and gives the period of leasing company's skill lease. It cannot fund all the leases to walte. (NPV) of that stream to the period of leasing company skill lease. It cannot fund all the leases leasing company.

for the machine, but ownership of the computer (and this is the important point) passes to the bank for the remainder of the lesse. The bank has become the lessor.

In practice, these operations take place simultaneously. The lessing company acts as infermediary between the bank (in fact, it may be a part of the bank) which has the money and the user which

In some cases the rental atream on long enough to cover the cost of the computer. The shortfall is called the residual and needs to be found either through selling the machine oo its return at the end of the least or through another lease.

is why it is orepared to lend to at well below market interes. Since the silowaice substitute for the first year, banks at your countries with financial was countries on different to throughton the large.

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Dramatic effect of the IBM Consent Decree

IBM computer leasing is based on operating leasing. This is a type of lease funding which is rare and applicable to few products - ships for one - but IBM computers

make up the largest single market. Conventional or finance leasing is where the finance source seeks to recover the capital cost of the item (plus interest and profit) by the end of the lease period. This is often five years but could fall

within the two to ten year range. Operating lessing is rather more complex, because the lessor eatlmates what the equipment will be worth ar the end of the lease period. He then discounts the rentals, assuming that sum, thereby providing the lessee (the user) with oheaper finance.

The lessor will expect to re-mar-

ket that equipment on a second lease to recover the outstanding portion of capital cost and his

The point of interest is: Why should this be applicable to IBM processors and very little cise? The: answer emerged first in 1956 when a legal decision was taken in the form of a Consent Decree signed between IBM and the US Justice

Department.
Before that, IBM was being taken to task for its monopolistic scrivities and came to a settlement with the Justice Department be-forefinal judgment, Leasing companies operate

therefore under the umbrella of the IBM Consent Decree, under a) Must offer all equipment for sale at prices which have an econo-mic link with IBM's own monthly

b) May not discriminate in any way between customers who pur-chase or rent equipment from it.

positions to different customers.
c) May not offer different stan-

cree, which is now built into IBM's business practices, is drapractice as well as in theory.

viduals transgress this policy, there are channels within IBM for companies like United Leasing to

by Parry Mitchell

raise the matter and, if policy

action will be taken.
The 360 computer series was announced in 1964, heralding the introduction of the basic 8-bit byte concept of computer architecture.
From that point onwards, the catchword "upward compatibility" became IBM's developmental guideline.

Companies make massive programs and software development, and the prospect of having to scrap these programs every four or five years because they no longer fit a manufacturer's omputer architecture is clearly

IBM committed Itself to a policy in 1964 whereby software investments would effectively be protected and if customers took more up-to-date equipment, they would be able to transfer these programs to the new equipment with relative esse.

way between customers who purchase or rent equipment from it.

c) May not offer different prices to different customers.

d) May not offer better delivery positions to different customers. modern IBM machines.

1BM - C	URRENT DPD Wester	PROCESSOR	S - 1980
Rented Purchased Leased	303X* 1.216 .366 .268	4300* 2.938 .373	Value & Million 3.991
* (Source: IDC Eur	1.850	3,722	.990 6.787

Table A: The European market for IBM processors as of mid-1980.

dards of maintenance, software support, etc, to different customers.

The effect of this Consent Decree, which is now built into the companies assured that the equipment would have a certain life

matic. IBM adheres to its policy in In circumstances where indi-

> velopments within the market The concept was born of the "ubiquitous" IBM computer, a. product that will function equally well in Chicago and Singapore and which will be maintained by the

same company in either location at approximately the same price.
On a worldwide basis, the invesinfringement has occurred, severe tor in IBM equipment could be certain that there was a large potential market for his equipment at

the end of the first lease perind. In selecting to offer operating leasing in the computer area, it la necessary for leasing companies to be certain of a market, not only to conclude the original lease but also, and much more importantly, to be confident about re-marketing

the equipment.

The columns in Table A Indicate the number by category of machines which are rented, putchased and leased, the right-hand column showing the total value of that market to be \$5.7 billion.

THERE are many computer equipment rental schemes but the

service is still dominated by a handful of established maintrame

manufacturers who regard hire and rental as 'delayed sale.'
In contrast, Hamilton Rentals

Prequently confused with

parent company Hamilton Leas-ing, Rentals came into existence when the two parted in 1978 and is

an independent operation. Rentals is a wholly-owned Hamilton

Group of Canada subsidiary as is its sister company LabHire Ltd.

It also shows that the equipment being rented from IBM comprises nearly 70% of the total and it is this market which computer leasing specialists approach whea re-IBM was not permitted to un-

marketing equipment.
In effect, the objective is to descut the leasing companies or to persuade companies to cancel their depart from their stated prices and rental agreemeats with IBM and the computer leasing company could predict medium-term dereplace them with machines

aupplied by us.

If Table A were split up by machine type, it would be noticeable that the larger the machine, the greater the proportion of pur-chased and lessed computers. This is because large computer users generally have the wherewithal to purchase rather than rent.

It can be seen quite clearly that there is a vast market potential for operating lessing but IBM's ability to retain the loyalty of its custom-ers is remarkable nevertheless. Wby do companies lease computers from computer leasing specialists? To a computer manager, the most important require-ment is to process data for the

company and the manager needs total flexibility to swap equipment around in order to meet company Renting equipment from IBM is very expensive but purchasing equipment or writing finance leases frequently puts the computer user in a strait-jacket, limiting

chairman of Londy. based United Leasing. Here he explains the workings of lease finance and its role as an aiternativa between renting w outright purchase. His remarks are concentrated . on IBM.

Parry Mitchellis

his or her flexibility to change

equipmeat when necessary.

Operating lessing atands in the middle; it is neither as constricting as the finance lease, nor as expensive as renting from IBM.

Operating lessors sell their products on the basis that the customer will want to keep his equipment for somewhere between three and five years.

The other advantage which computer leasing companies offer is prompt and relatively cheap delivery. Larger lessing companies bave significant quantities of equipment available from their own portfolio or on order from IBM. Computer leasing companies hould be able to offer savings over IBM, better delivery schedulea or

A piece of cautionary advice. Whenever you order any piece of IBM equipment, insist on aigning a purchase rather than a rental contract! The reason is that under IBM's purchase agreement you are month period until the scheduled

delivery date.

If general purchase point crease, you will be protected they decrease IBM will pass: benefit to you.

This is a standard class purchase agreement. Under the business practice, you had right to convert a purchet rental agreement at any time; the moment of shipment,

If you are trying to marine! profitability of your dependent minimising costs, it would a aense always to sign a pen agreement with IBM.

You can then decide up later date whether the enine is to be purchased, leased her a third party, or rented main through IBM direct.

Very few computer uni aware of this. How many see ically sign rental agreement they con vert to purchase nildate, having suffered on at which could have been me easily at no additional con?

ciectric typewriter, with a

processing playing an law role. Hamilton also often

packages on the market.

II, a sophisticated PDP-II's

Hamilton Is developing

prehensive software library

which eustomers will be them

to buy software or rent it it's

An in-house specialist and team is assembling hand written packages and it of liahing links with astable, houses to produce a post-covering initially accounting processing, numerical case, computer aid design, computer aid design, computer and attractural assembling a

graphics and atmotural

Customers can purchase

components from one south

neering programs.

The alternatives are to rent, lease or buy but deciding the option to follow is e complex question. There are no easy rules and the answer will be a compromise between many conflicting argu-Renting will normally be available only if you are dealing directly

to meet an organisation's business

requirements is often far from

simple. But with this important decision finally resolved another

large publem remains and this is

the best way to finance the acquisi-

microcomputers which are nor-

maliy sold via agents or as part of

The essence of renting equip-ment is that it remains the

property of the manufacturer; the

user simply pays for the right to

use. The user has the right to ter-

Penalty

During this period the user pays

periodic charges for the right to

At the end of the principal

period the user will normally have

the right to extend the period of

the lease, but no obligation to do

the lease is cancelled.

use the equipment.

ion of the system.

turnkey projects.

uirements.

beyond this is for a nominal charge. With the operating type of lease

with the manufacturer of the equipment. It is not practicable for the majority of smaller mini- and

In determining the likely

over three or more years, is expensive when compared to the other Extra rental charges may be levied if the equipment is used for more than one shift each working

Leasing is a longer-term arrangement than renting. A normal lease has a priocipal period of between three and seven years, during which the user pays a penalty if

this benefit into account when de-

THE choice of a computer system financial lease and the operating

the smaller firm

the options facing

Rent, lease or buy -

by making equal periodic

payments over a fairly long period. These payments are fully allowable

for tax purposes. There is a wide variety of sources of lease finance

and they offer a variety of terms.

Buying is the user's cheapest op-

tion, assuming the full benefit can be derived from the first-year allowances which accrue. The

disadvantages of buying are

Firstly, the user needs to find a

relatively large amount of cash at one time. This may have to be

With a financial lease, the leasing company expects to recoup the full cost of the equipment, plus interest and charges, during the

by Allen **Pawlyn**

the leasing company anticipates that the equipment will still have a realistic value after the expiry of the principal period, and takes this into account when determining the leasing charges to be paid by the leasing charges to be paid by the user. An operating lease is similar to a rental agreement, with a fixed period during which it cannot be cancelled without penalty.

minate the rental at fairly short notice (say three months). This makes rental a good choice where realisable value of the equipment, the leasing company obviously takes into account the chances of the user knows he will want to change the equipment within, for the equipment becoming obsolete. In the last two years this risk has example, two years, or where he is very uncertain of his future reincreased owing to the accelerating pace of technological change, and lessing companies have suffered losses by being unable to realise the assumed residual value of The benefit of flexibility inevitably carries a price tag and renting equipment, if extended equipment on which the lease has

expired or been terminated early. It is anticipated that this type of at best more expensive. It has al-ways tended to be applied mainly to the large mainframe system.

The financial lease, however, does not suffer the same disadvantage in the eyes of the leasing company and is available on almost any system, either via the supplier or by making arrangements indepen-dently with a leasing company. The reason financial lesses exist

derives from the granting of firstyear tax sllowances to a busioess which buys capital equipment. As the leasing company retains ownership of the asset, it is eligible for the first-year allowances and can therefore take a proportion of so. The equipment remains the termining the level of leasing property of the leasing company. charges.

There are two types of lease, the ... The user has the benefit of ac-

To rent, to lease or to buy? Atten Pawlyn, a partner in chartered accountants Fryer. Whitehili & Co, gives advice on this page to smaller companies considering the ecquisition of a mini- or microcomputer. He has recently been closely involved in the installation of his own firm's inhouse computer . . . which has been bought. He is pictured here existing en operator on one of the firm's Alpha micro systems, at its London offices.

Until recently, the proportion of a computer system was small, but modern technology has significently reduced the price of hardware while the cost of software in spiralling owing to ite hour-intensive nature.

FINANCING THE COMPUTER题

This presents the leasing com-panies with a problem. They recognise that hardware has an io-

Until recently, the proportion of the software cost to the total coal of if the user defaults on a lease, but aoftware has no value other than to the user for whom it was written or

For this reason, though they will contemplate leases involving a mixture of hardware and software, the leasing companies prefer that the software should represent 25%

Secondly the user takes on all the risks of the equipment becom-

change a system in response to changes in business requirements.

So far we have concentrated on

the different ways of acquiring

hardware, or at least the right to

use hardware. Where does soft-

If renting hardware direct from

negotiate a licence to use some o

the manufacturer's actiware pack-

age su that, in effect, hardware and

software are both rented. Software

may also be included in a leasing

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sive commitment to equipment sales although its primary financial objective was to generate rental income, as the name implies. It plans to drop "Rentals" from the company name.
Hamilton MD Gordon Brown

Hamilton Rentals claims exten-

Rentals plus all-round expertise

deals in a consumer directed business involving new or secondhand reotal and sale equipment, repurcomments: "We recognise the importance of customer delivery, pair and servicing, operator majotain extensive stocks and are training and software development or hire. The company bas also started its own manufacturing in the position to rent or sell the most appropriate system 'off the

The short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York,

Hamilton offers rental periods ranging between ooc month and s. year, enabling it to match even the most unusual customer require-

Its success is also based on a well-established Engineering Divi-sion, whose expertise goes beyond maintaining stock company equipment, and it deals with many com-puter, and terminal installations employing a wide variety of com-

Customers require properly-



is commissioned. What began as an informal Hamilton training facility, is now a fully-fledged school, whose students include equipment manufacturers' trainees. Carrying a wide range of stock items, Hamilton has developed interface design expertise enabling most system components to be in-

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Hamilton carries £4.5 million worth of stock including equip-ment fram DEC, Centranics, Hewlett-Packard, Texas, Hazeldine, Diablo, Teletype, and

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IRM

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policy whose success is proved 100% annual growth rate over the next two years. Hand plans a concerted effort to nate the European rental mark

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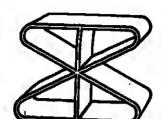
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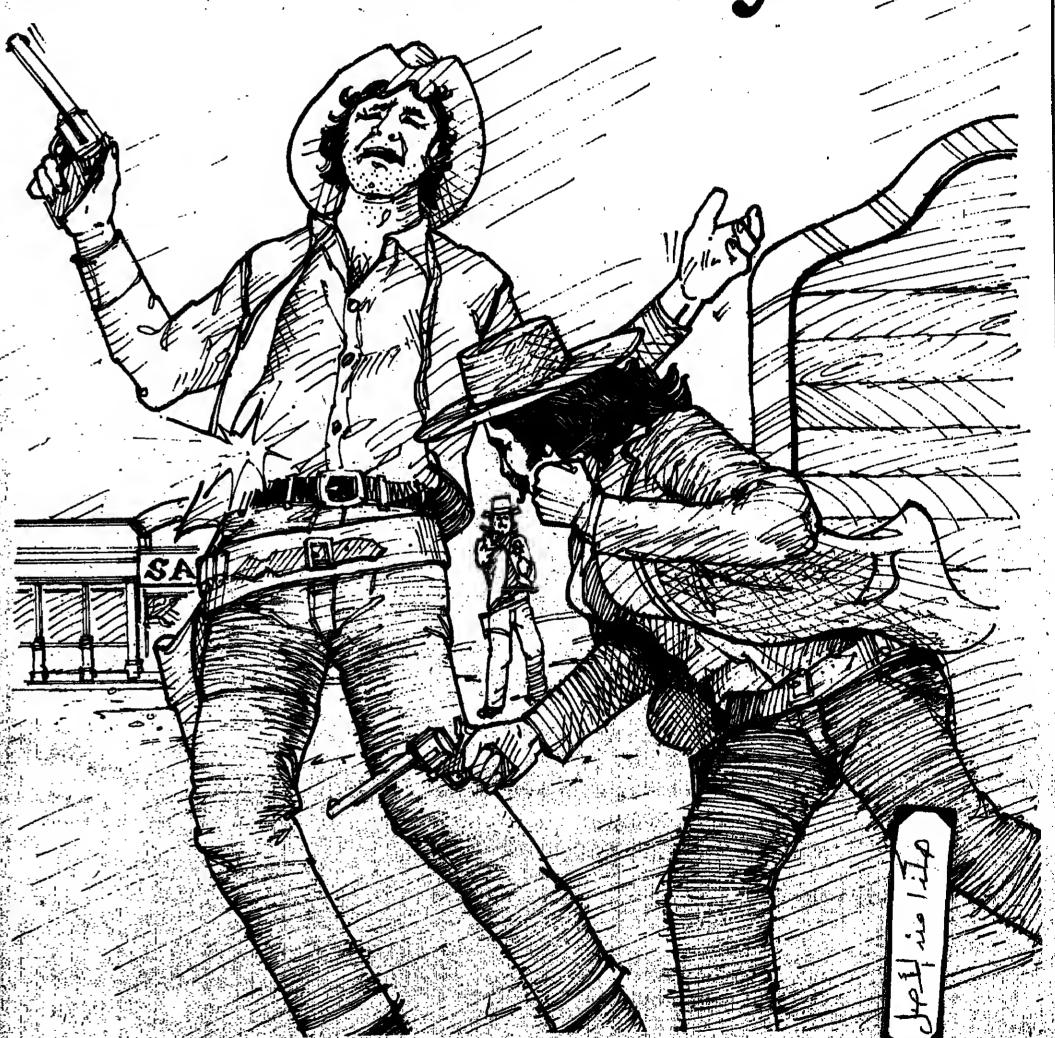
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Senior Systems Analyst

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Contact: Isobel Bruce

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commercial or financial environment.

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Contact: David Hendry

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supervision, therefore, the ability to produce concise reports and good communicative

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Involved with this exciting application.
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Contact: Jim Baker Contact: Jim Baker

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An excellent opportunity to progress in a challenging and professional environment.

Contact: Margaret Stevens

Senior Programmer

ideal opportunity to join a well established financial organisation who are in the process of installing two DEC 11/70's.

To apply, it is essential to have at least two years experience in a DEC environment using BASIC +/BASIC +/2. Also to have good knowledge of financial applications, plus the ability to deal with users and their problems.

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Contact: Janet Chilvers

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Contact: Brian Posties

Programmers

Our Client an expanding systems consultancy and looking for a number of programmers to design and develop specialised software for turnicey and on-lice projects.

Applicants should have a minimum of one years RPG, COBOL or CORAL, or any other standard high level language.

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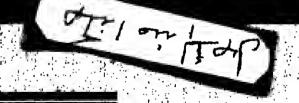
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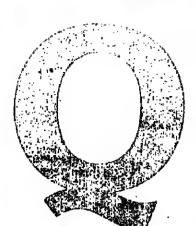


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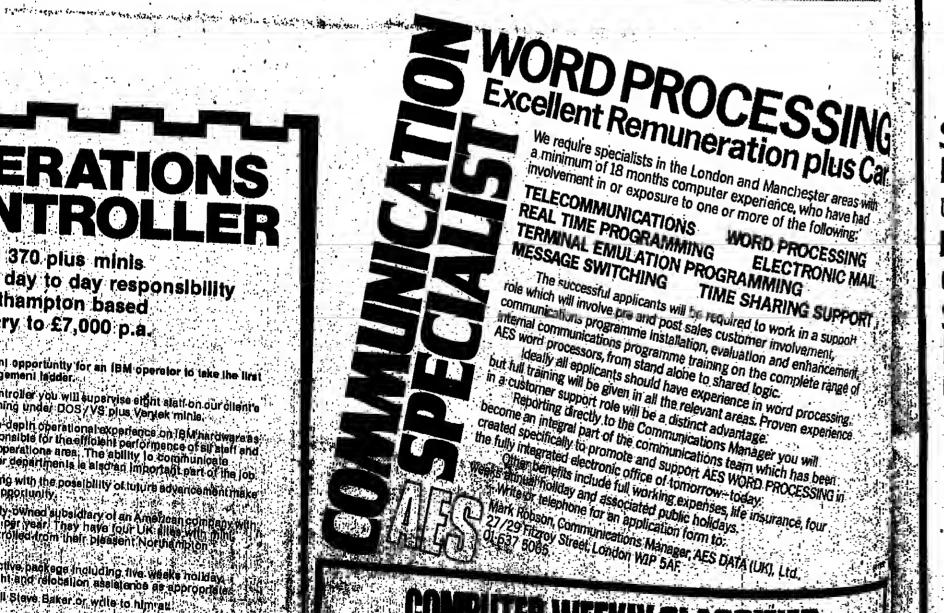
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NEW ZEALAND GOVERNMENT Computer Services Division STATE SERVICES COMMISSION

The Computer Services Division of the New Zealand State Services Commission provides computer services and advice for the majority of New Zealand Government Depertments. The Division is organised into a Head Office, four computer centres and a number of input

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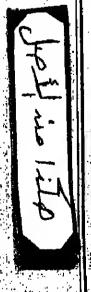
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APPLICATION forms, and further information are obtainable from the Personnel Section, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong, Completed forms together with copies of recent testimonials and one set of pajor publications should be returned before February 28, 1981 . Please mark 'Application' on

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regulred; minimum 3 years of expertance in compiler design and construction. Assembler and Paper I; creative and officiant practitioner. Experience it if DEC PD P-1 I dealing but, not elistoutely recessivy. Long-time job with top temutreration. Apply to ALKON AG ZURIGH, Fluretresse \$3, CH | SQ47 Zurigh Swittperland, Tx, 87681; Tel. (03) 84 52 84 ask for Mr. Bechingsin.

DHSS HYPERTENSION CARE COMPUTING PROJECT

This project, which is besed at Northwick Park Hospital, processes clinical date about patients being treated for raised blood pressure in a number of hospital chinica and general practices around the country. The processing is of present in batch on on ICL 1900 but o now 5-year grant has been obtained from the DHSS to extend the system and move it to the new local OEC 2080, and to acquire remote intelligent RJE terminals.

The project great supports four posts for computing probostionals and three of these are at present vecant. Applicants should have a formal training in computing up to graduats loval (or the equivalent langth and breadth of experience). The fangth and typo of post-graduats experience required veries with the different posto.

Principal Analyst/Programmer

£8,544 to £10,275 (NHS Scale 14) E8,844 to E1U,2/b (RFIS SCAIS 14)
This pest is for someone with considerable tochnicol knowledge and experience and the ability to lead the small team. The appointes will help to choose the new equipment end to design and implement the new system. At least five years' post-graduato experience including itle handling systems, programming in more then one language and supervising etaff, is required. This oppointment terminates with the current grant on May 3 f. 1985.

Senior Analyst/Programmer

£7,661 to £9,288 (NHS Scale 9) This post is for someone to retriave end snalyss data from the file and help with the new system. At least two years' post-graduate experience of systems analysis and programming, prelarably within a team, is required. This appointment is for two years.

Analyst/Programmer £6,839 to £8,221 (NHS Scale 4)

This post is for someone to design and implement progress and will afford the opportunity for some experience of systems ensiyate and design. It is suitable for someone who has received appropriate training and wishes to develop their career by obtaining practical experience. This appointment is for two years.

Further particulars and application forms may be obtained from the District Personnel Department, Hammersmith Hospital, Du Cane Road, London, W.12. Telephone: 01-743 2030, extension 48. The closing date is February 9th, 1981.

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Our requirements for this post are a minimum of 4 years' eppropriete experianca with at leeat 2 years in e senior supervisory capacity. Proven experience of controlling a TP network

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Application forms can be obtained from:-

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£9,411 to £10,542

(1st April £9,878-£10,731)

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The Force Technical Computer Officer will essume control of hardware and software of a Honeywell Level 9 computer based. Commend and Control system utilising a duel processor system euoporting sixty. Visual Display Units and larty printers, for which a contract has been awarded. He / she will be expected to listing with police officers at all levels and give technical advice on problems ensing with the operation of all the computer equipment associated with the South Wales Constabulary.

Applicants should have a ratevant degree or professional qualification and considerable experience of the design and programming of dedicated real time systems using minimular hardware. The position is suitable for a person durantly in a senior technical support position seeking wider managerial and technical responsibility.

Write or telephone for an application form, returnable by the 9th February, 1981; to The Chief Constable, South Wales Constabulary (Computer Project), Polica Headquariers, 3ridgend CF31/3SP. Telaphone 0856 55556 (extension 361/382). Candidates who have ciready applied need not reapply as their application will be considered effor the revised closing date. Assistance with housing and relocation expanses with figure and relocation expanses.

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Sydney Roed Enfield, Middx. EN2 6UE Tel: 01-366 6611 (Ext. 276)

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SENIOR SYSTEMS ANALYST/PROGRAMMER required with a good knowledge of DLI and COBOL. Hardware in use IBM 4341 running under DOS/VSE and CICS. Knowledge of the IBM package COPPICS adventageoue, not essentiel, Applications to be worked on include an on-line production/inventory control eyetem and other meterials management modules.

MINI/MICRO epecialists required to write USER REFERENCE MANUALS for a new range of MICRO's being devaloped.

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THE SALES BIT

Common causes of failure in sales recruitment

learly to he avoided, there is a final decision to doubt that heyond an arbitrary point of two to three proceedings along, while se-weeks' duration, the chances curing more than one of recruiting a good candidate npinion, is to have tandent decline at an exponential rate. interviewa. This could involve decline at an exponential rate. interviews. This could involve In most eases the problem is a two levels of sales manage matter of priorities. Sales ment or the introduction of managers can easily delude themselves into believing that department. recruitment must have a lesser priority than sales active few weeks ago we had a sales ity and administrative candidate, calling for his third

Unrealistic requirements and procrastination are also significant causes of delay in

the recruitment process, Peter Jones, of Tymshare, sometimes refers to a recruitattractions of his company relative to those of other competing employers, looks for a star" who is prepared to transfer for average rewards and solve all the selling prob-

Indecision . When he eventually realises now unrealistic his stance is, that such people are at a premium and typically cannot afford to leave their present source of high reward, and did, he begins to modify his position. This often develops into a period of indecision

The chosen method of recruitment can also lead to delay and failure. Sometimes, into a period of indecision about the kind of secondary lternative that is acceptable. Eventually he gets into the unrecoverable position of being unable to compensate for the revenue loss brought

next job vacancy he has is his. The best kind of respondents to recruirment advertis-ing are often those who have not definitely decided to change their employment: Their attention was caught by an advertisement and they decided, perhaps on impulse, to A lot of time can be wasted discover more about the job in on inadequate or unaultable question. However, once hey people; whereas a campaign have attended an iloterview measured to the employer's

Lost impetus

I have often seen the situation where candidates without any other lob in mind have applied for a job, following an advertisement, and by the time they are invited to the third or lourth interview have managed to obtain firm offers of employment from competitive companies or even started a new tob! Ridiculous, blit trigand recurrent.

Loss of impetus usually ments loss of bast applicants. ceoding bases, starting with terviews between the initial 1,000 (bask 2).

LAST week I wrote about the meeting and the formal offer common occurrence of sales of employment has a signifirecruitment failure, due pri- cant bearing on the duration marily to a lack of urgency at of the overall recruitment branch sales management process. Practice varies con-level. Of course, there are siderably from one company many other reasons why good to another, but in my opinion candidates are lost; also a it should never take more number of ways to raise the than three meetings, involvvel of success. ing two or more representa-While indecent haste is tives of the employer, to reach

A good way to hurry the proceedings along, while se-

process. This may be true for a while, but the price of delaying recruitment soon becomes into the sales department. He very high; particularly in the declined the invitation —of form of new business sales. course!

Preparation

failure of agles recruitment is the nature of the interview Candidates often complain o George Best syndrome. This is where a sales manager, rather than observing the realities of what is available, tory definition. This kind of the price he can afford and the situation can only serve to de

cover all aspects of the job situation. They should also be terview is just another sale are selling and both are buy ing. Trial closes and fine closes are very much part of the action, if the deal feels right, ask for the order! The chosen method of re-

companies to a hurry to recruit decide to shop around the agencies, rather than Ity of candidates from agence files will apend up the proce dates oo agency files may be failures in their present job or fall-out from the recruitmen of other companies, perhap even direct competitors.

Wasted

and discover they are a com- precise requirements can be modify in demand, they can clitice those actively seeking quickly get into the mood for further employment, and changing jobs.

Any gap in the proceedings job-hunting. After all, a provides both the opportunity successful salesman is unand incentive to seek alternative to be actively involved

in the job market.

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